PCI Modem Card

User's Manual

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April 2002, Rev01

Contents

CHAPTER 1 INTRODUCTION 1

1.1 Features 1

1.2 System Requirements 2

1.3 Package Contents 2

CHAPTER 2 HARDWARE INSTALLATION 3

2.1 Installing the Card 3

2.2 Connection 3

CHAPTER 3 SOFTWARE INSTALLATION 5

3.1 For Windows 95 5

3.2 For Windows 98 7

3.3 For Windows Me 9

3.4 For Windows NT4.0 10

3.5 For Windows 2000 12

3.6 For Windows XP 14

CHAPTER 4 CONFIGURING COUNTRIES 17

4.1 For Windows 95/98/Me 17

4.2 For Windows NT4.0 18

4.3 For Windows 2000/XP 20

CHAPTER 5 VERIFY MODEM INSTALLATION 21

5.1 For Windows 95/98/Me 21

5.2 For Windows 2000/XP 23

CHAPTER 6 UNINSTALLING THE DRIVERS 25

6.1 For Windows 98/Me 25

6.2 For Windows NT4.0 26

6.3 For Windows 2000/XP 27

APPENDIX A AT COMMANDS 29

A.1 AT Commands 29

A.1.1 Data and General Commands 29

A.1.2 FAX Commands 60

A.2 Result Codes..... 64
A.3 S-Registers 66

APPENDIX B SPECIFICATIONS 69

APPENDIX C GLOSSARY..... 75

APPENDIX D ASCII CODE TABLE 79

Chapter 1 Introduction

Congratulations on the purchase of your new 56K modem! This handbook will help you through the installation procedure. You also can use the commands in this book to customize the performance of your modem, although this is not required for normal operation.

1.1 Features

- Two-chip soft modem solution with an integrated 5 V tolerant PCI interface
- Data mode capabilities:
  - ITU-T V.92* : 56000 bits/s—28000 bits/s
  - ITU-T V.90* : 56000 bits/s—28000 bits/s
  - ITU-T V.34: 33600 bits/s—2400 bits/s
  - V.32bis, and fallbacks
  - V.42 and *MNP* error correction (LAPM)
  - V.44, V.42bis and *MNP* Class 5 data compression
- FAX mode capabilities:
  - ITU-T V.17, V.29, V.27ter, and V.21 Ch 2
  - ITU-T T.31 Class 1 FAX
- Compatible with transformer-based and silicon DAA circuits:
  - Line-powered silicon DAA
- Bit I/Os to support domestic and international DAAs
- Supports standard PCI and Mini PCI buses with PCI version 2.2
- Ideal for mobile computing and high performance/low power applications
- Flexible power management modes
- Common driver across multiple platforms
- Operating system support:
  - Windows 95/98/Me/2000/NT 4.0/XP
  - PC 2001 compliant

* Due to FCC limitations, speeds of 53 kbits/s are the maximum permissible transmit power levels during download transmission. Actual data speeds will vary depending on the line conditions.

1.2 System Requirements

- Pentium® III or above
- Windows 95®/ 98®/ Me®/ NT4.0®/ 2000® / XP® operating system
- One available PCI slot
- 32 MB RAM or more
- CD-ROM drive

1.3 Package Contents

Your PCI modem package must include the following items:

- PCI Modem Card
- Software Utility/Driver CD
- Quick Installation

Chapter 2 Hardware Installation

2.1 Installing the Card

Step1 With the power to your computer disconnected, remove PC casing.

Note: Some PCI compliant motherboards supply power to the slots even when the PC is turned off. To prevent damage to your PC or PCI modem card, always unplug the power cord when installing or removing PCI modem cards**.**

Step 2 Press the PCI card into the empty PCI slot firmly, and secure it with screws to your computer.

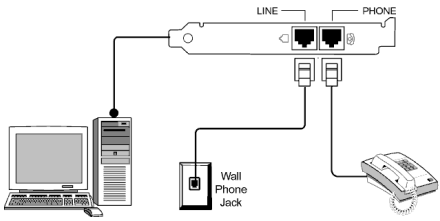
Step 3 Reinstall the casing on your computer.

2.2 Connection

Step 1 Plug one end of the phone cord into LINE jack and the other end to the wall phone jack.

Step 2 When you are not using the modem, you can use a telephone on the modem's phone line. Plug your telephone's cord into the modem's PHONE jack.

The figure below illustrates the typical connection of internal modem card.



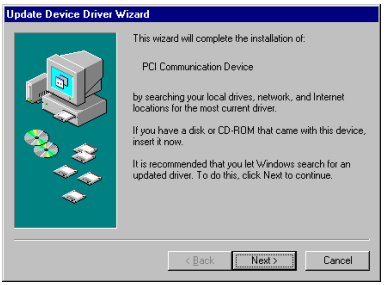
After hardware installation, turn on your computer and the system should detect the modem upon startup. Proceed to next section to install the drivers.

Chapter 3 Software Installation

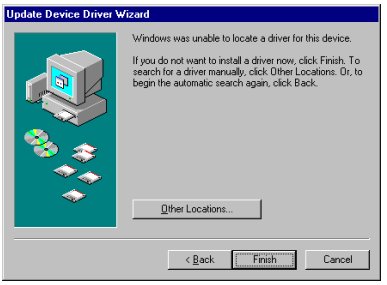
3.1 For Windows 95

Start Windows 95 and insert the provided CD into your CD-ROM drive to start driver installation.

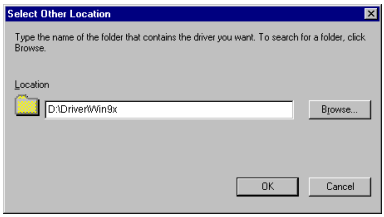
Step 1 The **Update Device Driver Wizard** screen will appear detecting a new device and request for the driver. Click **Next**.


Update Device Driver Wizard
This wizard will complete the installation of:
PCI Communication Device
by searching your local drives, network, and Internet locations for the most current driver.
If you have a disk or CD-ROM that came with this device, insert it now.
It is recommended that you let Windows search for an updated driver. To do this, click Next to continue.
< Back
Next >
Cancel

Step 2 Windows will be unable to locate the driver; click **Other Locations**.


Update Device Driver Wizard
Windows was unable to locate a driver for this device.
If you do not want to install a driver now, click Finish. To search for a driver manually, click Other Locations. Or, to begin the automatic search again, click Back.
Other Locations...
< Back
Finish
Cancel

Step 3 Click **Browse** to specify the path to **X:\Driver\Win9x** where X is the CD-ROM drive letter and click **OK**.



Step 4 Windows will find the location of the driver; click **Finish**.

Step 5 When prompted to insert disk, click **OK**.

Step 6 In **Copying Files** window, click **Browse** to specify the path to **X:\Driver\Win9x** where X is the CD-ROM drive letter and click **OK**.

Step 7 Windows will continue to detect the voice device. Click **Next** and then repeat steps 2-4 to complete the installation.

Update Device Driver Wizard
This wizard will complete the installation of:
Wave Device for Voice Modem
by searching your local drives, network, and Internet locations for the most current driver.
If you have a disk or CD-ROM that came with this device, insert it now.
It is recommended that you let Windows search for an updated driver. To do this, click Next to continue.
< Back
Next >
Cancel

When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to “Chapter 4 Configuring Countries” on page 17 for instructions.

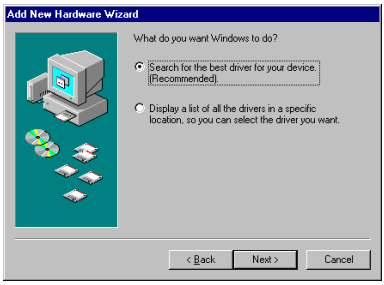
3.2 For Windows 98

Start Windows 98 and insert the provided CD into your CD-ROM drive to start driver installation.

Step 1 The **Add New Hardware Wizard** screen will appear detecting a new device and request for the driver. Click **Next**.

Add New Hardware Wizard
This wizard searches for new drivers for:
PCI Communication Device
A device driver is a software program that makes a hardware device work.
< Back
Next >
Cancel

Step 2 Select **Search for the best driver for you device** and click **Next**.


Add New Hardware Wizard
What do you want Windows to do?
Search for the best driver for your device. (Recommended).
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel

Step 3 Check **Specify a location**, click **Browse** to specify the path to **X:\Driver\Win9x** where X is your CD-ROM drive letter and click **OK**. Then click **Next**.

Add New Hardware Wizard
Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected locations. Click Next to start the search.
Floppy disk drives
CD-ROM drive
Microsoft Windows Update
Specify a location:
D:\Driver\Win9x
Browse...
< Back
Next >
Cancel

Step 4 Windows will find the location of the driver; click **Next**.

Step 5 Click **Finish**.

Add New Hardware Wizard
Agere Systems PCI Soft Modem
Windows has finished installing the software that your new hardware device requires.
< Back
Finish
Cancel

Step 6 Windows will continue to detect the voice device. Click **Next** and then repeat steps 2-5 to complete the installation.

Add New Hardware Wizard
This wizard searches for new drivers for:
Wave Device for Voice Modem
A device driver is a software program that makes a hardware device work.
< Back
Next >
Cancel

When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to “Chapter 4 Configuring Countries” on page 17 for instructions.

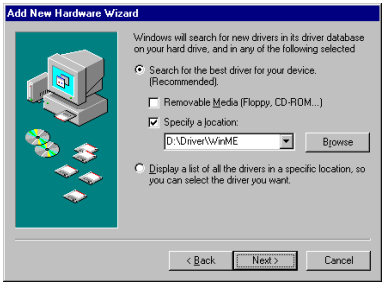
3.3 For Windows Me

Start Windows Me and insert the provided CD into your CD-ROM drive to start driver installation.

Step 1 Your computer detects new hardware and displays the **Add New Hardware Wizard** window. Select the **Specify the location of the driver** option and click **Next**.

Add New Hardware Wizard
Windows has found the following new hardware:
PCI Communication Device
Windows can automatically search for and install software that supports your hardware. If your hardware came with installation media, insert it now and click Next.
What would you like to do?
Automatic search for a better driver (Recommended)
Specify the location of the driver (Advanced)
< Back
Next >
Cancel

Step 2 Insert the provided CD into your CD-ROM drive. Select **Search for the best driver for your device** and then check **only** the **Specify a location** box. Click **Browse** to specify the path to **X:\Driver\WinME** where X is your CD-ROM drive letter and click **Next**.


Add New Hardware Wizard
Windows will search for new drivers in its driver database on your hard drive, and in any of the following selected
Search for the best driver for your device. (Recommended).
Removable Media (Floppy, CD-ROM...)
Specify a location:
D:\Driver\WinME
Browse
Display a list of all the drivers in a specific location, so you can select the driver you want.
< Back
Next >
Cancel

Step 3 When Windows finds the driver file for the device, click **Next**.

Step 4 When the following window appears, click **Finish**.

Step 5 Windows will continue to detect another device. Repeat Steps 1-4.

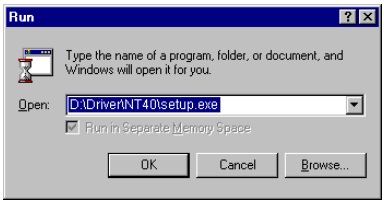
Add New Hardware Wizard
Windows has found the following new hardware:
Modem Device
Windows can automatically search for and install software that supports your hardware. If your hardware came with installation media, insert it now and click Next.
What would you like to do?
Automatic search for a better driver (Recommended)
Specify the location of the driver (Advanced)
< Back
Next >
Cancel

Step 6 When **New Hardware Found** windows appear, wait for Windows to complete the installation.

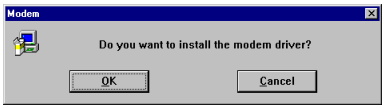
When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to “Chapter 4 Configuring Countries” on page 17 for instructions.

3.4 For Windows NT4.0

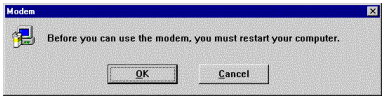
Step 1 Click **Start** menu and then click **Run**. Click **Browse** to open the file **Setup.exe** from **X:\Driver\NT40** where X is your CD-ROM drive letter and click **OK**.



Step 2 When confirm message appears, click **OK**.



Step 3 When prompted to restart your computer, click **OK**.



When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/laws. Please proceed to “Chapter 4 Configuring Countries” on page 17 for instructions.

3.5 For Windows 2000

Start Windows 2000 and insert the provided CD into your CD-ROM drive to start driver installation.

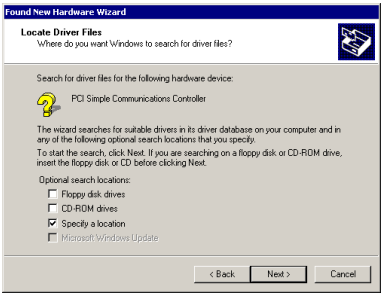
Step 1 The **Found New Hardware Wizard** screen will appear detecting a new device and request for the driver. Click **Next**.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install a device driver for a hardware device.
To continue, click Next.
< Back
Next >
Cancel

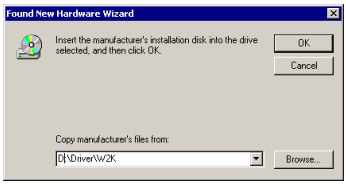
Step 2 Select **Search for a suitable driver for my device** and click **Next**.

Found New Hardware Wizard
Install Hardware Device Drivers
A device driver is a software program that enables a hardware device to work with an operating system.
This wizard will complete the installation for this device:
PCI Simple Communications Controller
A device driver is a software program that makes a hardware device work. Windows needs driver files for your new device. To locate driver files and complete the installation click Next.
What do you want the wizard to do?
Search for a suitable driver for my device (recommended)
Display a list of the known drivers for this device so that I can choose a specific driver
< Back
Next >
Cancel

Step 3 Check only **Specify a location**, and click **Next**.

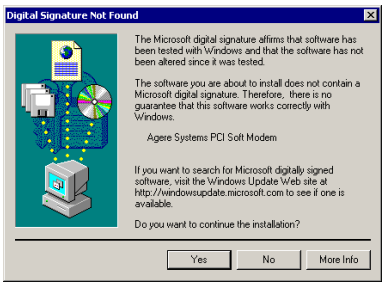

Found New Hardware Wizard
Locate Driver Files
Where do you want Windows to search for driver files?
Search for driver files for the following hardware device:
PCI Simple Communications Controller
The wizard searches for suitable drivers in its driver database on your computer and in any of the following optional search locations that you specify.
To start the search, click Next. If you are searching on a floppy disk or CD-ROM drive, insert the floppy disk or CD before clicking Next.
Optional search locations:
Floppy disk drives
CD-ROM drives
Specify a location
Microsoft Windows Update
< Back
Next >
Cancel

Step 4 Click **Browse** to locate the path of the driver: **x:\Driver\W2K** (where x: represents your CD-ROM drive) and click **OK**.



Step 5 Windows will find the location of the driver; click **Next**.

Step 6 If **Digital Signature Not Found** window appears, click **Yes** to continue.


Digital Signature Not Found
The Microsoft digital signature affirms that software has been tested with Windows and that the software has not been altered since it was tested.
The software you are about to install does not contain a Microsoft digital signature. Therefore, there is no guarantee that this software works correctly with Windows.
Agere Systems PCI Soft Modem
If you want to search for Microsoft digitally signed software, visit the Windows Update Web site at http://windowsupdate.microsoft.com to see if one is available.
Do you want to continue the installation?
Yes
No
More Info

Step 7 Click **Finish**. When **Found New Hardware** window appears, wait for Windows to complete the installation.

Found New Hardware Wizard
Completing the Found New Hardware Wizard
Agere Systems PCI Soft Modem
Windows has finished installing the software for this device.
To close this wizard, click Finish.
< Back
Finish
Cancel

When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to “Chapter 4 Configuring Countries” on page 17 for instructions.

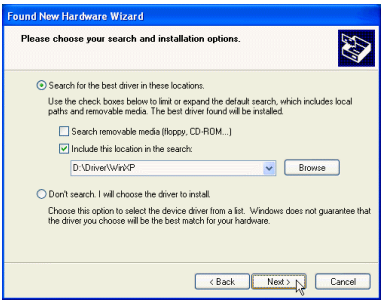
3.6 For Windows XP

Start Windows XP and insert the provided CD into your CD-ROM drive to start driver installation.

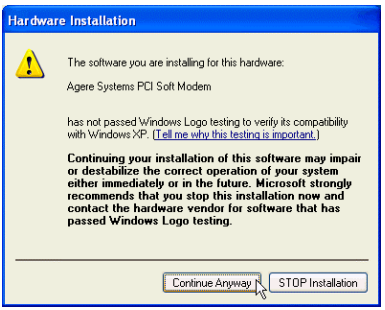
Step 1 When **Found New Hardware Wizard** screen appears, select **Install from a list or specific location (Advanced)** and click **Next**.

Found New Hardware Wizard
Welcome to the Found New Hardware Wizard
This wizard helps you install software for:
PCI Simple Communications Controller
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

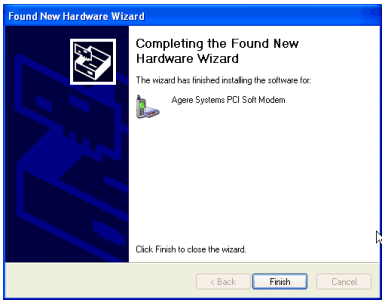
Step 2 With **Search for the best driver in these locations** selected, select ONLY **Include this location in the search**. Click **Browse** to specify the path to **X:\Driver\WinXP** where X is your CD-ROM drive letter and click **Next**.


Found New Hardware Wizard
Please choose your search and installation options.
Search for the best driver in these locations.
Use the check boxes below to limit or expand the default search, which includes local paths and removable media. The best driver found will be installed.
Search removable media (floppy, CD-ROM...)
Include this location in the search:
D:\Driver\WinXP
Browse
Don't search. I will choose the driver to install.
Choose this option to select the device driver from a list. Windows does not guarantee that the driver you choose will be the best match for your hardware.
< Back
Next >
Cancel

Step 3 If compatibility prompt message appears, click **Continue Anyway**.


Hardware Installation
The software you are installing for this hardware:
Agere Systems PCI Soft Modem
has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)
Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.
Continue Anyway
STOP Installation

Step 4 Click **Finish**. When **Found New Hardware** screen appears, wait for completing the installation.


Found New Hardware Wizard
Completing the Found New Hardware Wizard
The wizard has finished installing the software for:
Agere Systems PCI Soft Modem
Click Finish to close the wizard.
< Back
Finish
Cancel

When you are done with driver installation, you will need to specify the country where you locate upon different telecommunication regulations/ laws. Please proceed to “Chapter 4 Configuring Countries” on page 17 for instructions.

Chapter 4 Configuring Countries

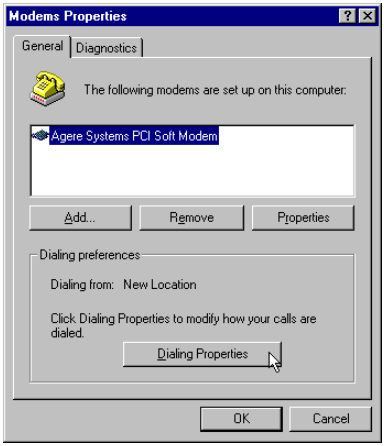
Before using the modem, you may need to specify the country where you locate upon different telecommunication regulations/ laws. If you have configured your country during the installation process, just ignore this section.

4.1 For Windows 95/98/Me

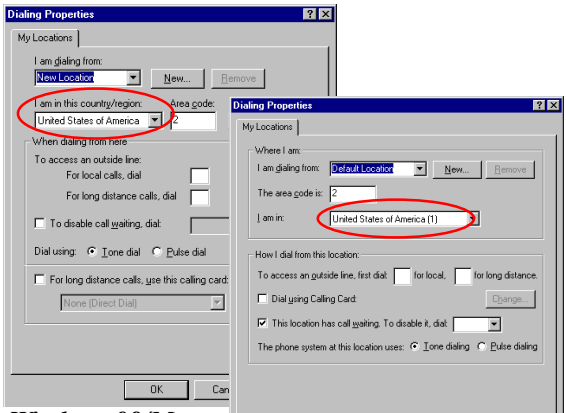
Note: If you are prompted with **Location Information** screen during configuration, enter your area code and then click **Close** or **OK**.

Step 1 Click **Start** menu, point to **Settings** and click **Control Panel**. On the Control Panel, double-click the **Modems** icon.

Step 2 In **Modems Properties** window, highlight **Agere Systems PCI Soft Modem** and click **Dialing Properties**.



Step 3 From the drop-down list of **I am in** (for Windows 95) or **I am in this country/region** (for Windows 98/Me), select a country where your modem is to be used and click **Apply** (for Windows 98/Me only) and then **OK**.



Windows 98/Me

Windows 95

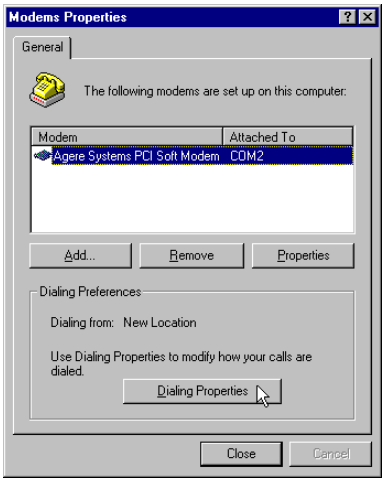
Step 4 You will return to the **Modems Properties** window. Click **OK** to return to **Control Panel**.

4.2 For Windows NT4.0

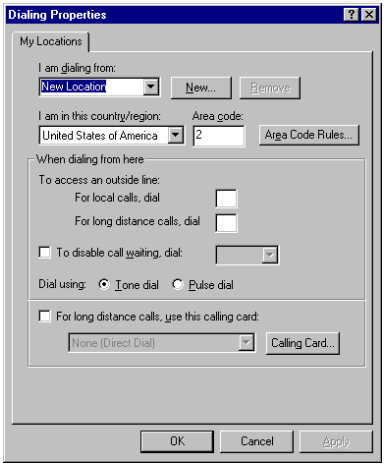
Step 1 Click **Start** menu, point to **Settings** and click **Control Panel**. On the Control Panel, double-click the **Modems** icon.

Note: If you are prompted with **Location Information** screen, enter your area code and then click **Close**.

Step 2 In **Modems Properties** window, highlight **Agere Systems PCI Soft Modem** and click **Dialing Properties**.



Step 3 From the drop-down list of **I am in this country/region**, select a country where your modem is to be used and click **Apply** and then **OK**.



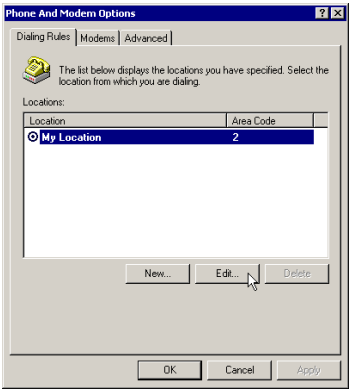
4.3 For Windows 2000/XP

Note: The configuration steps are the same in Windows 2000 and Windows XP. The graphics here assume a Windows 2000 environment.

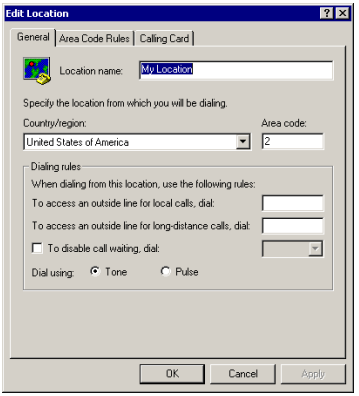
Step 1 Click **Start** menu, point to **Settings** and click on **Control Panel**. On the Control Panel, double-click the **Phone and Modem Options** icon.

Note: If you are prompted with **Location Information** screen, enter your area code and then click **OK**.

Step 2 On the **Dialing Rules** tab, select the location from which you are dialing and then click **Edit**.



Step 3: On the **General** tab, from the drop-down list of **Country/region** select the country where your modem is to be used. Click **Apply** and then click **OK**.



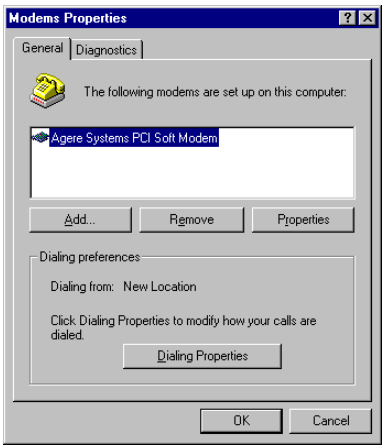
Chapter 5 Verify Modem Installation

If you are going to install data/fax communications software, you may start with a quick test to check that the Windows can communicate with your modem.

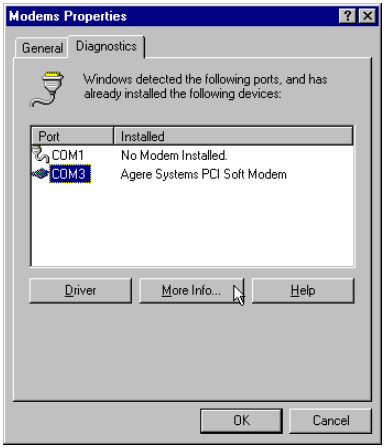
5.1 For Windows 95/98/Me

Step 1 Click **Start** menu, point to **Settings** and then click **Control Panel**. Double-click the **Modems** icon.

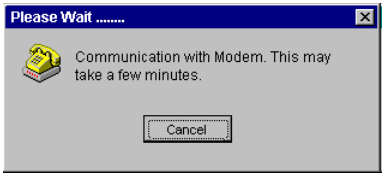
Step 2 Click the **Diagnostics** tab.



Step 3 Highlight the COM port used by your modem and then click **More Info…**.

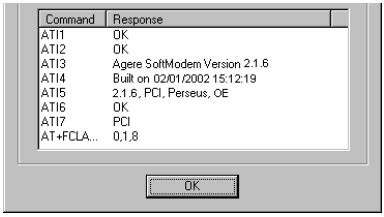


Step 4 Wait for communication with your modem.



Step 5 If your modem is properly installed, the command response (something like AT…) should appear on the screen.

Congratulations! You have successfully installed the modem hardware and its driver.



* According to your model, the command responses may differ from shown above.

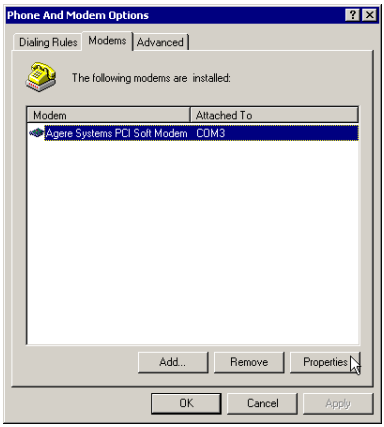
Note: If your modem fails to respond, you will see an error message. Make sure your modem is properly connected. Switch your modem off and on, and try again. If your modem still fails to respond, you may need to remove the driver and reinstall again.

5.2 For Windows 2000/XP

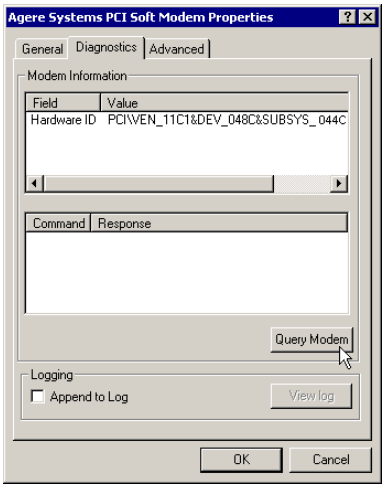
Note: The verification steps are the same in Windows 2000 and Windows XP. The graphics here assume a Windows 2000 environment.

Step 1 Click **Start** menu, point to **Settings** and then click **Control Panel**. Double-click the **Phone and Modem Options** icon.

Step 2 In the **Phone And Modem Options** window, click the **Modems** tab. Highlight **Agere Systems PCI Soft Modem** and then click **Properties**.



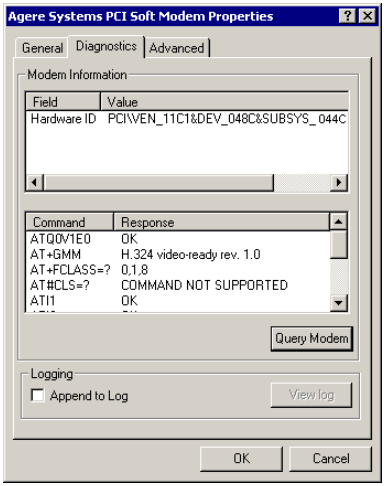
Step 3 Click the **Diagnostics** tab and then click **Query Modem**.



Step 4 Wait for communication with your modem.

Step 5 If your modem is properly installed, the command response (something like AT…) should appear on the screen.

Congratulations! You have successfully installed the modem hardware and its driver.



* According to your model, the command responses may differ from shown above.

Note: If your modem fails to respond, you will see an error message. Make sure your modem is properly connected. Switch your modem off and on, and try again. If your modem still fails to respond, you may need to remove the driver and reinstall again.

Chapter 6 Uninstalling the Drivers

This chapter describes how to uninstall the modem software from your system. If you are going to uninstall the modem device permanently, follow these steps:

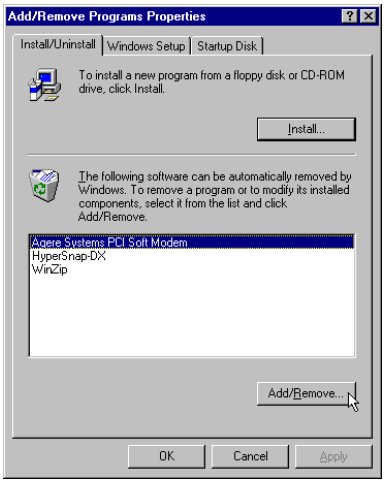
1. Uninstall the software first as described in this chapter.
2. Shut down your PC. Power off the PC and unplug all the peripherals. Remove the cover and pull the modem card out of its PCI slot.
3. Then reinstall the cover and the peripherals.

It is also possible that you want to reinstall or upgrade the driver. If this is the case, uninstall the modem software and restart your PC as described in this chapter . Then refer to the installation instructions to install required driver.

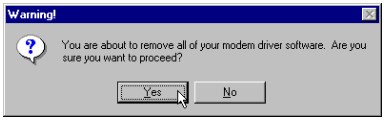
6.1 For Windows 98/Me

Step 1 Click **Start**, point to **Settings** and click on **Control Panel**. On the Control Panel, double-click the **Add/Remove Programs** icon.

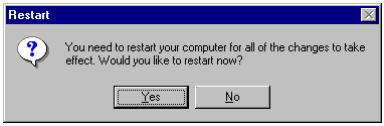
Step 2 When **Add/Remove Programs Properties** window appears, on the **Install/Uninstall** tab, select **Agere Systems PCI Soft Modem** from the list and click **Add/Remove**.


Add/Remove Programs Properties
Install/Uninstall
Windows Setup
Startup Disk
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Agere Systems PCI Soft Modem
HyperSnap-DX
WinZip
Add/Remove...
OK
Cancel
Apply

Step 3 Click **Yes** to remove the components.



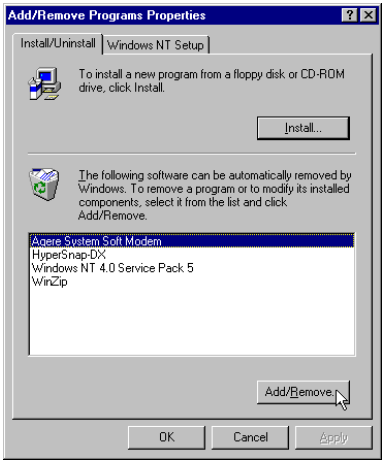
Step 4 When prompted to restart your computer, select **Yes** or **No** as required.



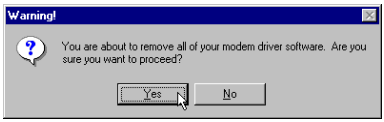
6.2 For Windows NT4.0

Step 1 Click **Start**, point to **Settings** and click on **Control Panel**. On the Control Panel, double-click the **Add/Remove Programs** icon.

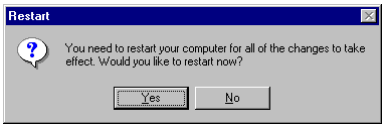
Step 2 When **Add/Remove Programs Properties** window appears, on the **Install/Uninstall** tab, select **Agere System Soft Modem** from the list and click **Add/Remove**.


Add/Remove Programs Properties
Install/Uninstall
Windows NT Setup
To install a new program from a floppy disk or CD-ROM drive, click Install.
Install...
The following software can be automatically removed by Windows. To remove a program or to modify its installed components, select it from the list and click Add/Remove.
Agere System Soft Modem
HyperSnap-DX
Windows NT 4.0 Service Pack 5
WinZip
Add/Remove...
OK
Cancel
Apply

Step 3 Click **Yes** to remove the components.



Step 4 When prompted to restart your computer, select **Yes** or **No** as required.

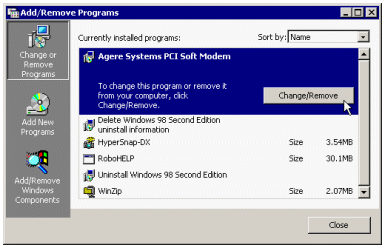


6.3 For Windows 2000/XP

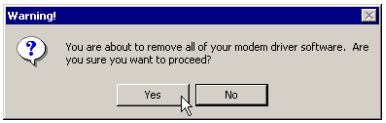
Note: The removing steps are the same in Windows 2000 and Windows XP. The graphics here assume a Windows 2000 environment.

Step 1 Click the **Start** menu, point to **Settings** and then click **Control Panel**. Double-click the **Add/Remove Programs** (or **Add or Remove Programs** for Windows XP) icon.

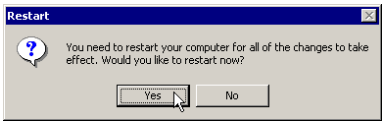
Step 2 Highlight **Agere Systems PCI Soft Modem** from the list and then click **Change/Remove**.



Step 3 Click **Yes** to remove the components.



Step 4 When prompted to restart your computer, select **Yes** or **No** as required.



Appendix A AT Commands

AT Command Set

AT commands are issued to the modem to control the modem's operation and software configuration. The basic command syntax is as follows:

<command><parameter>

The <command> is a combination of the attention prefix (AT) followed by the AT command. The <parameter> is a string which represents a numeric decimal value.

Note: If a parameter value is not entered then the soft modem assumes a parameter value of zero.

Any command issued is acknowledged with a response in either text or numeric values. These responses are known as result codes.

AT commands can only be entered while the modem is in command mode. Command mode is entered under one of the following conditions:

- After powerup, at the termination of a connection, or after the execution of a command other than dial or answer.
- Upon the receipt of the escape sequence (three consecutive characters matching the contents of register S2) while in on-line mode.
- Upon the on-to-off transition of DTR if **&D**1, **&D**2, or **&D3** has been set.

A.1 AT Commands

A.1.1 Data and General Commands

+++Escape Sequence

An escape sequence allows the modem to exit data mode and enter on-line command mode. While in on-line command mode, AT commands are sent directly to the modem. Use the return to on-line data mode command (see O<value>—Return to On-Line Data Mode) to return to data mode.

Place a pause before and after the escape sequence to prevent the modem from interpreting the escape sequence as data. The length of the pause is set

by register S12 (see S12—Escape Guard Time), the escape guard time. Register S2 (see S2—AT Escape Character) identifies the escape sequence character.

A/—Repeat Last Command

Use this command to repeat the last AT command. The modem repeats the command currently in the command buffer. Do not use the AT prefix with this command. Do not conclude the command with a terminating character such as enter.

A—Answer

This command instructs the soft modem to go off-hook and answer an incoming call.

B<value>—Communication Standard Setting

Use this command to select the communication standard used by the soft modem.

B0	Selects CCITT V.22 mode when the modem is at 1200 bits/s.
B1	Selects Bell 212A when the modem is at 1200 bits/s (default).
B2	Deselects V.23 reverse channel (same as **B**3).
B3	Deselects V.23 reverse channel (same as **B**2).
B15	Selects V.21 when the modem is at 300 bits/s.
B16	Selects Bell 103J when the modem is at 300 bits/s (default).

C<value>—Carrier Control

This command is supported to ensure compatibility with communications software that issues the **C1** command.

However, this modem does not support the **C0** command. The **C0** command instructs some modems not to send carrier (i.e., it puts them in receive-only mode).

C1	Normal transmit carrier switching (default).

D<dial string>—Dial

This command instructs the soft modem to go off-hook and begin the dialing sequence. The dial string (<dial string>, including modifiers and the telephone number) is entered after the **D** command.

A dial string can be up to sixty characters long. Any digit or symbol may be dialed as touchtone digits. Characters such as spaces, hyphens, and

parentheses are ignored by the modem and may be included in the dial string to enhance readability.

Dial Modifiers

Modifier	Function Name	Description
L	Dial the last number	Instructs the modem to dial the last number dialed. This modifier is valid only if it is the first symbol of the dial string. All consecutive characters are discarded.
P	Select pulse dialing	—
T	Select tone dialing(default)	—
W	Wait for dial tone	Instructs the modem to wait for a second dial tone before processing the dial string.
,	Dial pause	Instructs the modem to pause before processing the next character in the dial string. Register S8 determines the length of the pause.
!	Hook flash	Instructs the modem to go on-hook for 0.5 s and then return to off-hook.
@	Wait for quiet answer	Instructs the modem to wait for 5 s of silence after dialing the number. If silence is not detected, the modem sends a NO ANSWER result code back to the user.
;	Return to command mode	Instructs the modem to return to command mode after it has finished dialing without disconnecting the call. This modifier must be the last character in the dial string.
$	Bong tone detection	—
S=<location>	Dial from register	Instructs the modem to dial a telephone number previously stored using the **&Z<location>=<dial string>** command. Valid storage locations are 0—3.

E<value>—Echo Command

Use this command to enable or disable the soft modem echo feature. When the echo feature is selected and the modem is in command mode, characters sent to the modem are sent back to the host and displayed on the monitor.

E0	Disables echo command.
E1	Enables echo command (default).

F<value>—On-Line Data Character Echo Command

This command is supported to ensure compatibility with communications software that issues the **F1** command.

The **F0** version of this command is not supported. This command was originally used to set echo features for the DTE.

F0	On-line data character echo enabled (not support).
F1	On-line data character echo disabled.

H<value>—Hook Control

This command instructs the modem to go either on-hook to disconnect a call or off-hook to make the telephone line busy.

H0	soft modem goes on-hook (default).
H1	soft modem goes off-hook.

I<value>—Request ID Information

This command displays specific product information about the modem.

I0, I3	Returns modem identity string and driver version number.
I1	Returns OK.
I2	Returns OK.
I4	Returns the driver build date.
I5	Returns the driver version, bus type (PCI, AC97), codec type, and country.
I6	Returns OK.
I7	Hardware version.
I8	Codec type.
I9	Returns country ID in English.
I10, I11	Displays connection information. If the modem has not connected with a remote DCE the **ATI 11** commands returns - No Previous Call.

The **ATI 11** command may be issued from on-line command mode or after the end of a call. After a call, some of the values are no longer valid.

The following table describes each of the results listed for the **ATI 11** command.

ATI11 Command Results

Result	Description
Last Connection	V.90, V.34, or V.32, depending on the type of connection negotiated.
Initial Transmit Carrier Rate	Initial upstream rate.
Initial Receive Carrier Rate	Initial downstream rate.
Final Transmit Carrier Rate	Current or final upstream rate.
Final Receive Carrier Rate	Current or final downstream rate.
Protocol Negotiation Result	LAPM, MNP *, or none, depending on V.42 negotiation.
Data Compression Result	LAPM, MNP, or none, depending on V.42 negotiation.
Estimated Signal/Noise Ratio	Signal to noise ratio with implied negative. Higher values indicated better conditions.
Receive Signal Power Level (–dBm)	The received signal power, although labeled with units of –dBm, is only a relative measure for comparing calls to/from different locations. This value is valid only during a call.
Transmit Signal Power Level (–dBm)	Upstream transmit signal power.
Round Trip Delay (ms)	Round trip delay in milliseconds.
Near Echo Level (–dBm)	Near echo levels only.
Far Echo Level (–dBm)	Far echo levels only.
Transmit Frame Count	Number of LAPM frames sent upstream during this call. Count wraps around at 65535.
Transmit Frame Error Count	Number of REJ frames received at the analog client modem.

Receive Frame Count	Number of LAPM frames received by the client during this call. Count wraps around at 65535.
Receive Frame Error Count	Number of frames received in error by the client.
Retrain by Local Modem	Number of retrains or rate renegotiations requested by the modem.
Retrain by Remote Modem	Number of retrains or rate renegotiations requested by the remote modem.
Call Termination Cause	Reason for call ending. Only valid after call ends. Result codes are as follows: ● 0 = local modem command: ATH, DTR drop. ● 1 = remote modem: cleardown, loss of signal. ● 2 = no answer, busy, etc. ● 3 = training failure V.90 or V.34. ● 4 = protocol failure if required by \N4, for example.
Robbed-Bit Signaling	For PCM connection only, a hexadecimal 6-bit pattern of T1 frames with robbed-bit signaling.
Digital Loss (dB)	For PCM connection only, the downstream digital loss.
Remote Server ID	—

L<value>—Speaker Volume

Use this command to set the monitor speaker volume setting when the speaker is on.

L0 Low volume.

L1 Low volume.

L2 Medium volume (default).

L3 High volume.

M<value>—Speaker Control

Use this command to turn the monitor speaker on or off.

M0 Speaker is off.

M1 Speaker is on until the modem detects the carrier signal (default).

M2 Speaker is always on when the modem is off-hook.

M3 Speaker is on until the carrier is detected, except when dialing.

N<value>—Modulation Handshake

Use this command to set the modem protocol for handling handshake negotiation at connection time if the communication speed of the remote modem is different from the speed of the local modem.

N0 When originating or answering, this is for handshake only at the communication standard specified by register S37 and the **B<value>** command.

N1 When originating or answering, begin the handshake only at the communication standard specified by S37 and the **B<value>** command. During handshake, fallback to a lower speed may occur (default).

O<value>—Return to On-Line Data Mode

Use this command to exit on-line command mode and reenter on-line data mode. If the modem is not in on-line command mode when this command is received, it generates an ERROR result code.

O0 Instructs the soft modem to exit on-line command mode and return to data mode.

O1 Issues a retrain before returning to on-line data mode.

O3 Issues a rate renegotiation before returning to on-line data mode.

P—Select Pulse Dialing

Use this command to configure the modem for pulse dialing. All subsequent **D<dial string>** commands use pulse dialing until either the **T** command or a tone dial modifier is received by the modem. Tone dialing is the default setting.

Do not supply parameters with this command unless it is used as part of a dial modifier.

Q<value>—Result Code Control

Result codes are informational messages sent from the modem and displayed on the monitor. Basic result codes include OK, CONNECT, RING, NO CARRIER, and ERROR. The **Q<value>** command allows the user to turn result codes on or off.

Q0	Enables result codes (default).
Q1	Disables result codes.

S<register_number>=<value>—S Register Control

Use this command to view or change an S-register. S-registers contain parameters used by the modem. This command has two forms: one to show the contents of the register and one to change the contents of the register. Some registers are read only and are not affected by the **S<register number>=<value>** command. Each register has a specific function.

S<register_number>?	Displays register contents.
S<register_number>=<value>	Sets the contents of the register to <value> if the register is not read only.

T—Select Tone Dialing

Use this command to configure the modem for DTMF tone dialing. All subsequent **D<dial string>** commands use tone dialing until either the **P** command or a pulse dial modifier is received by the modem. Tone dialing is the default setting. Do not supply parameters with this command unless it is used as part of a dial modifier.

V<value>—DCE Response Format

The result codes using one of two formats. Verbose mode generates result codes in a text format using words. Numerical mode generates result codes as a number. Each result code has a number assigned to it. Use this command to switch between numerical and verbose modes. Call progress and negotiation progress messages are affected by this command.

V0	Displays result codes as digits. Numerical mode.
V1	Displays result codes as text (default). Verbose mode.

W<value>—Result Code Option

Use this command to select the modems CONNECT message options.

W0	CONNECT result code reports DTE receive speed. Disables protocol result codes.
W1	CONNECT result code reports DTE receive speed. Enables protocol result codes.
W2	CONNECT result code reports DCE receive speed. Enables protocol result codes (default).

X<value>—Extended Result Codes Control

Use this command to select which result codes are used by the modem. The

parameter of this command is stored in bits 4—6 of register S22.

X<value> Commands

Command	Description
X0	Busy detection is disabled; blind dialing (no dial tone detection) is enabled. The following result codes are supported: • OK • CONNECT • RING • NO CARRIER • ERROR
X1	Busy detection is disabled; blind dialing (no dial tone detection) is enabled. The following result codes are supported: • OK • RING • NO CARRIER • ERROR • CONNECT <RATE>
X2	Busy detection is disabled; blind dialing is disabled. The dialing cannot be conducted unless a dial tone is detected. If dial tone is not detected within the time specified by register S6, the NO DIAL-TONE result code will be reported. The following result codes are supported: • OK • RING • NO CARRIER • ERROR • NO DIALTONE • CONNECT <RATE>
X3	Busy detection is enabled; blind dialing is enabled. The following result codes are supported: • OK • RING • NO CARRIER • ERROR • BUSY • CONNECT <RATE> • BLACKLISTED
X4	Busy detection is enabled; blind dialing is disabled. The dialing cannot be conducted unless a dial tone is detected. If dial tone is not detected within the time specified by register S6, the NO DIAL-TONE result code will be reported. The following result codes are supported: • OK • RING • NO CARRIER • ERROR • NO DIALTONE • BUSY • CONNECT <RATE> • DELAYED • BLACKLISTED • WARBLE

	• CALL WAITING DETECTED
X5	Busy detection is enabled; blind dialing is disabled. The dialing cannot be conducted unless a dial tone is detected. If dial tone is not detected within the time specified by register S6, the NO DIAL-TONE result code will be reported. The following result codes are supported: • OK • RING • NO CARRIER • ERROR • NO DIALTONE • BUSY • CONNECT <RATE> • RRING • NO BONGTONE • DELAYED • BLACKLISTED • WARBLE • CALL WAITING DETECTED

Y<value>—Long-Space Disconnect

This command is supported to ensure compatibility with communication software that issues the **Y0** command. Long-space disconnect is always disabled.

Y0 Disables long-space disconnect (default).

Z<value>—Reset and Recall Stored Profile

Use this command to force the soft modem to go on-hook and restore a profile saved by the **&W** command. Soft modem products have two stored profiles and the active profile. The <value> parameter selects the stored profile to copy into the active profile.

Z0 Reset and restore stored profile 0.

Z1 Reset and restore stored profile 1.

&B<value>—V.32 Auto Retrain

This command is supported to ensure compatibility with communications software that issues the **B1** command. The **B0** version of this command is not supported.

&B0 Disable V.32 auto-retrain (not supported).

&B1 Enable V.32 auto-retrain (default).

&C<value>—Data Carrier Detect (DCD) Control

Use this command to control the modem's response to receiving a remote modems carrier signal. Data carrier detect (DCD) is a signal from the modem to the DTE indicating that the carrier signal is being received from a remote modem. The modem typically turns off DCD when it no longer detects the remote modems carrier signal.

&C0 Modem ignores the state of the carrier from the remote modem. DCD remains on at all times.

&C1 Modem turns on DCD when the remote modem's carrier signal is detected and turns off DCD when the carrier signal is not detected (default).

&D<value>—Data Terminal Ready (DTR) Control

Use this command to set how the soft modem responds to the DTR signal.

&D0 The soft modem ignores the true status of DTR and treats it as always on. Use this selection only if the computer does not provide DTR to the modem.

&D1 If the DTR signal is not detected while in on-line data mode, the modem enters command mode, issues the OK result code, and remains connected.

&D2 If the DTR signal is not detected while in on-line data mode, the modem disconnects (default).

&D3 Reset modem on the on-to-off DTR transition.

&G<guard tone>—V.22 bis Guard Tone Control

Use this command to select which guard tone, if any, the modem will send while transmitting in the high band (answer mode). This command is only used in V.22 and V.22 bis mode. This option is not used in North America; it is for international use only.

&G0 Disables guard tone (default).

&G1 Selects 550 Hz guard tone.

&G2 Selects 1800 Hz guard tone.

&J<value>—Auxiliary Relay Option

This command is supported to ensure compatibility with communications software that issues the **J0** command.

&J0 The auxiliary relay is never closed (default).

&K<value>—Local Flow Control Selection

Use this command to set the soft modem flow control method.

&K0 Disables flow control.

&K3 Enables RTS/CTS (hardware) flow control (default).

&K4 Enables XON/XOFF flow control.

&M<value>—Asynchronous Communications Mode

This command is supported to ensure compatibility with communication software that issues the **&M0** command.

The preferred method for changing the asynchronous communication mode is to use the **\N<error control mode>** command.

&M0 Asynchronous mode (default).

&P<value>—Pulse Dial Make-to-Break Ratio Selection

This command is effective only for Japan.

&P0 Selects 39%—61% make/break ratio at 10 pulses per second.

&P1 Selects 33%—67% make/break ratio at 10 pulses per second (default).

&P2 Selects 33%—67% make/break ratio at 20 pulses per second.

&Q<value>—Asynchronous Communications Mode

This command is supported to ensure compatibility with communication software that issues the **&Q<value>** command.

The preferred method for changing the asynchronous communication mode is to use the **\N<error control mode>** command.

&Q0 Asynchronous mode, buffered. Same as **\N**0.

&Q5 Error control mode, buffered (default). Same as **\N**3.

&Q6 Asynchronous mode, buffered. Same as **\N**0.

&Q8 MNP error control mode. If an MNP error control protocol is not established, the modem will fall back according to the current user setting in register S36.

&Q9 V. 4 2 o r MNP error control mode. If neither error control protocol is established, the modem will fall back according to the current user setting in register S36.

&S<value>—Data Set Ready (DSR) Option

Use this command to controls DSR action.

&S0 DSR is always on (default).

&S1 DSR comes on after establishing a connection and goes off when the connection ends.

&T<value>—Self-Test Commands

Use this command to perform diagnostic tests on the modem. Each test is designed to isolate a problem location when experiencing periodic data loss or random errors.

&T0 Abort. Terminates the test in progress.

&T1 Initializes local analog loopback, V.56 Loop 3. If a connection exists when this command is issued, the modem hangs up. The modem displays the CONNECT <rate> message at the start of the test.

&T3 Local digital loopback test, V.54 Loop2. If no connection exists, the soft modem returns ERROR.

&T6 Requests a remote digital loop back, V.54 Loop 2 without self test. If no connection exists, the soft modem returns ERROR and generates the CONNECT<rate> result code.

&V<value>— Display Current Configuration

Use this command to display the current soft modem configuration. The modem maintains two stored profiles and the active profile. This command displays all three configurations and any stored telephone numbers.

&W<value>—Store Current Configuration

Use this command to store the modems command options and all S registers except S3, S4, and S5. The **Z<value>** command or a powerup reset, of the modem, restores this profiles.

&W0 Stores the current configuration as profile 0.

&W1 Stores the current configuration as profile 1.

&Y<value>—Select Stored Profile for Hard Reset

This command does not change the behavior of the modem but is included for compatibility with applications that issue the **&Y** command.

&Z<storage location>=<dialing sting>—Store Telephone Number

Use this command to store a dialing string. The soft modem can save four dialing strings. The dial string may contain up to 34 characters. The **ATDS=<storage location>** command dials using the stored string.

\A<value>—Select Maximum MNP Block Size

The modem will operate an MNP error corrected link using a maximum block size controlled by the parameter sup-plied.

\A0 64 characters.

\A1 128 characters.

\A2 192 characters.

\A3 256 characters (default).

\B<break time>—Send Break

Use this command in non-error-controlled mode. It instructs the modem to transmit a break signal to the remote modem. The minimum break length is 100 ms and the maximum break length is 900 ms. The <break time> parameter has values between one and nine with each increment representing 100 ms. The command works in conjunction with the **\K** command.

\G<value>—Modem Port Flow Control

Instructs the DCE to process XON/XOFF flow control or pass XON/OFF flow control to the remote DCE.

\G0 The modem processes XON/XOFF flow control characters locally (default).

\G1 The modem passes XON/XOFF flow control characters.

\J<value>—Adjust Bits/s Rate Control

Use this command to specify whether or not the negotiated connect speed of the modem forces the adjustment of the speed of the DTE to the modem's speed.

\J0 Buffer mode. Error control is set or disabled with the **\N<value>** command (default).

\J1 Forces the maximum DCE rate to the DTE rate.

\K<value>—Set Break Control

Use this command to control the response of the modem to a break received from the DTE, remote modem, or the **\B<value>** command.

When Modem Is Operating in Data Transfer Mode:

\K0, \K2, K4 Enter on-line command mode. No break is sent to the remote modem.

\K1 Clears data buffers and sends a break to the remote modem.

\K3 Sends a break to the remote modem immediately.

\K5 Sends a nondestructive, non expedited break to the remote modem (default).

The second case occurs when the modem is in the on-line command state (waiting for AT commands) during a data connection, and the **\B<value>** command is received in order to send a break to the remote modem.

When Modem Is On-Line Command State During Data Connection:

\K0, \K1 Clears data buffers and sends a break to the remote modem.

\K2, \K3 Sends a break to the remote modem immediately.

\K4, \K5 Sends a break to the remote modem in sequence with data (default).

Finally, the third case occurs when a break is received from a remote modem during a connection.

When Break Is Received During Connection:

\K0, \K1 Clears data buffers and sends a break to the DTE.

\K2, \K3 Sends a break to the DTE immediately.

\K4, \K5 Sends a break to the DTE in sequence with received data (default).

\N<error_control>—Select Error Control Mode

Use this command to select the type of error control used by the modem when sending or receiving data.

\N0 Buffer mode. No error control (same as **&Q**6).

\N1 Direct mode.

\N2 MNP or disconnect mode. The modem attempts to connect using MNP 2—4 error control procedures. If this fails, the modem disconnects. This is also known as MNP reliable mode.

\N3 V.42, MNP, or buffered (default). The modem attempts to connect in V.42 error control mode. If this fails, it will attempt to connect in MNP mode. If this also fails, soft modem connects in buffer mode and continues operation. This is also known as V.42/ MNP auto reliable mode (same as **&Q**5).

\N4 V.42 or disconnect. The modem attempts to connect in V.42 error control mode. If this fails, the modem disconnects.

\N5 V. 4 2 , MNP, or buffered (same as **N**3).

\N7 V. 4 2 , MNP, or buffered (same as **N**3).

\Q<value>—Local Flow Control Selection

Use this command to set the local flow control method.

\Q0 Disables flow control (same as **&K**0).

\Q1 XON/XOFF software flow control (same as **&K**4).

\Q3 RTS/CTS to DTE (same as **&K**3) (default).

\R<value>—Ring Indicator Signal Off After Answer

This command is supported to ensure compatibility with communications software that issues the **\R0** command.

\R0 Ring indicator signal is off after the telephone call is answered.

\T<time delay>—Inactivity Timer

Use this command to specify the delay time used by the inactivity timer. The delay time is the length of time in minutes that the modem waits during periods of inactivity before disconnecting. Periods of inactivity are defined by no data being sent or received by the DCE. To disable the inactivity timer, use the **T0** command. The delay time may also be specified in register S30.

This function is only applicable in buffer mode.

\T0 Inactivity timer disabled (default).

\T1—\T255 Specifies the length of time in minutes that the modem will wait before disconnecting when no data is sent or received.

\V<value>—Protocol Result Code

Use this command to enable or disable protocol result codes.

\V0 Disables protocol result code appended to DCE speed.

\V1 Enables protocol result code appended to DCE speed (default).

\V2 Enables protocol result code appended to DCE speed (same as **\V**1).

%B—View Numbers in Blacklist

If blacklisting is in effect, this command displays the numbers that are currently blacklisted, failed, or delayed. The ERROR result code appears for countries that do not support blacklisting.

%C<value>—Data Compression Control

Use this command to enable or disable V.42 bis and MNP class 5 data compression. On-line changes do not take effect until a disconnect occurs.

%C0 V.42 bis/ MNP 5 disabled. No data compression.

%C3 V.42 bis/ MNP 5 enabled. Data compression enabled (default).

%E<value>—Auto Fallback/Fallforward Control

This command provides the option for the modem to automatically monitor line quality, to fall back when line quality is insufficient, and to fall forward when line quality is sufficient.

%E0 Disables fallback/fallforward.

%E1 Enables fallback and disable fallfor-ward.

%E2 Enables fallback/fallforward (default).

-C<value>—Data Calling Tone

Use this command to enable or disable the data calling tone after a call is originated. The data calling tone is a tone of a certain frequency and cadence as specified in V.25 which allows remote data/FAX/voice discrimination. The frequency is 1300 Hz with a cadence of 0.5 s on and 2.0 s off.

-C0 Disabled (default).

-C1 Enabled.

-V90=<rate>—Enable/Disable V.90 Settings

-V90=<rate>Controls the downstream rate.

-V90=0 Disables V.90.

-V90=1 Enables V.90 auto rate (default).

-V90? Displays the current value.

-V90=? Shows the range of <rate>.

-V90=<rate> Equivalent Downstream Rates:

<rate> Value	Downstream Rate	<rate> Value	Downstream Rate
0	V.90 disabled.	12	41333 kbits/s.
1	Auto rate (default).	13	42666 kbits/s.
2	28000 kbits/s.	14	44000 kbits/s.
3	29333 kbits/s.	15	45333 kbits/s.
4	30666 kbits/s.	16	46666 kbits/s.
5	32000 kbits/s.	17	48000 kbits/s.
6	33333 kbits/s.	18	49333 kbits/s.

7	34666 kbits/s.	19	50666 kbits/s.
8	36000 kbits/s.	20	52000 kbits/s.
9	37333 kbits/s.	21	53333 kbits/s.
10	38666 kbits/s.	22	54666 kbits/s.
11	40000 kbits/s	23	56000 kbits/s.

+A8E=<v8o>,<v8a>,<v8cf>,<v8b>—V.8 and V.8 bis Operation Controls

Use this command to set the control parameters for early call negotiation through V.8 and V.8 bis. +**A8**E* may also be used as an action command to reinitiate V.8 or V.8 bis if an earlier attempt to use either protocol has failed.

<v8o> enables or disables DCE-controlled V.8 origination negotiation; <v8a> enables or disables DCE-controlled V.8 answer negotiation; <v8b> disables V.8 negotiation or sets it to DCE controlled or DTE controlled negotiation.

The <a8cf> parameter sets the V.8 CI signal call function to the value specified. The valid range for this parameter is 0—FF, with a default of 0xC1.

Valid <v8o> Values:

1 Enables DCE-controlled V.8 origination negotiation (default).

6 Enables DCE-controlled V.8 origination negotiation, issue +A8x indications.

Valid <v8a> Values

1 Enables DCE-controlled V.8 answer negotiation (default).

5 Enables DCE-controlled V.8 answer negotiation, issue +A8x indications.

Valid <v8cf> Values

1 Enables DCE-controlled V.8 origination negotiation.

6 Enables DCE-controlled V.8 origination negotiation, issue +A8x indications.

Valid <v8b> Values

0 Disables V.8 negotiation.

1 Enables DCE-controlled V8 bis negotiation (default).

2 Enables DTE-controlled V.8 negotiation.

+A8T=<signal>,<1st_message>,<2nd_message>,<sig_en>,<msg_en>,<supp_delay>—Send V.8 bis Signal and/or Message

This command instructs the DCE to send a V.8 bis signal or message. This command is only supported when V.80 is enabled.

Valid <signal> Values:

0 None.
1 Initiating Mre.
2 Initiating MRd.
3 Initiating CRe, low power.
4 Initiating CRe, high power.
5 Initiating CRd.
6 Initiating Esi.
7 Responding MRd, low power.
8 Responding MRd, high power.
9 Responding CRd.
10 Responding Esr.

Valid <sig_en> Values:

0 Enables detection of initiation signals (default).
1 Enables detection or responding signals.

Valid <msg_en> Values:

0 Disables detection of messages (default).
1 Enables detection of V.8 bis messages.

Valid <supp_delay> Values

0 No delay inserted (default).
1 Inserts a 1.5 s delay between transmitted V.8 bis signal and the subsequent V.8 bis message.

+DR<value>—Data Compression Reporting

Use this command to enable or disable the compression report. If the compression report is enabled, the +DR:<type> intermediate result code reports the current DCE-DCE data compression type. It is issued after the error control report (+ER) and before the final result code (e.g., CONNECT).

+DR Data Compression Report Value

+DR=0	This command disables the compression report.
+DR=1	This command enables the compression report.

+DR Data Compression Reporting Intermediate Result Codes

+DR: NONE	Data compression is not in use.
+DR: V42B	V.42 bis is in use in both directions.
+DR: V42B RD	V. 42 bis is in use in the receive direction.
+DR: V42B TD	V. 42 bis is in use in the transmit direction.
+DR: V44	V.44 is in use in both directions.
+DR: V44 RD	V.44 is in use in the receive direction.
+DR: V44 TD	V.44 is in use in the transmit direction.

+DS=<direction>,<compression_negotiation>,<max_dict>,<max_string> —V. 4 2 bis Data Compression

Use the **+DS** command to configure the V.42 bis data compression method used by the modem. The settings of this command overwrite the setting of a **%C<value>** command. However, it can also be overwritten by **%C<value>** command.

The <direction> parameter sets which directions use the compression method. The soft modem use compression in one or both directions.

Valid <direction> Values:

0	Modem negotiates no V.42 bis compression.
1	Modem negotiates transmit only V.42 bis compression.
2	Modem negotiates receive only V.42 bis decompression.
3	Modem accepts V.42 bis compression in both or either direction (default).

The <compression_negotiation> parameter tells the modem whether it should disconnect if V.42 negotiations fail.

The soft modem AT command set does not support the disconnect feature when V.42 negotiation fails and the <compression_negotiation> parameter is always set to 0. The <max_dict> and <max_string> parameters specify the maximum number of dictionary entries and maximum string length for the modem to negotiate. Their default values are 4096 and 32, respectively.

+DS44=<direction>,<compression_negotiation>, <capability>, <max_codewords_tx>,<max_codewords_rx>,<max_string_tx>,<max_string_rx>,<max_history_tx>,<max_history_rx>—V.44 Data Compression

Use this command to configure the V.44 data compression method used by the modem. The soft modem never disconnect if V.44 is not negotiated and always use the streaming method for data transfers.

As a result, <compression_negotiation> and <capability> are always 0.

The <direction> parameter sets which directions use the compression method. The soft modem use compression in one or both directions.

Valid <direction> Values:

0	Modem negotiates no V.44 compression.
1	Modem negotiates transmit only V.44 compression.
2	Modem negotiates receive only V.44 decompression.
3	Modem accepts compression in both or either direction (default).

The <max_codewords_tx> parameter specifies the maximum number of code words to negotiate in the transmit direction. The <max_codewords_rx> parameter specifies the maximum number of code words to negotiate in the receive direction.

Valid <max_codewords_tx> and <max_codewords_rx> Values:

2048	Default <max_codewords_tx> and <max_codewords_rx> value.
512, 1024, 2048	Valid transmit and receive code word settings.

The <max_string_tx> parameter specifies the maximum string length to negotiate in the transmit direction. The <max_string_rx> parameter specifies the maximum string length to negotiate in the receive direction.

Valid <max_string_tx> and <max_string_rx> Values:

255	Default <max_string_tx> and <max_string_rx> value.
32—255	Valid transmit and receive string lengths.

The <max_history_tx> parameter specifies the maximum length of the history buffer to negotiate in the transmit direction. The <max_history_rx> parameter specifies the maximum length of the history buffer to negotiate in the receive direction.

Valid <max_history_tx> and <max_history_rx> Values:

6144	Default <max_history_tx> and <max_history_rx> value.
1024, 2048, 4096, 1536, 3072, 6144	Valid maximum transmit and receive history buffer sizes.

+EB=<break_selection>,<timed>,<default_length>—Break Handling In Error Control Operation

Use this command to set the modem behavior when a BREAK is received. The <break_selection> parameter sets the type of break sent to the remote DCE when a break is received from the local DTE. The <timed> parameter sets whether the V.42 L-SIGNAL send the break length. The <default_length> parameter sets the length of the break sent to the local DTE when the modem receives a break from the remote DTE that does not have a defined break length. The <default_length> is defined in milliseconds and has a default value of 30 (30 ms).

Valid <break_selection> Values

0	Ignore break (default).
1	Non expedited, nondestructive.
2	Expedited, nondestructive.
3	Expedited, destructive.

Valid <timed> Values:

0	V.42 L-SIGNAL does not indicate break signal length.
1	V.42 L-SIGNAL indicates break signal length.

Valid <default_length> Values:

0	Modem does not deliver a break to the DTE.
1—255	Modem delivers a break of the length set by the <default_length> parameter.

+EFRAM=<value 1>,<value 2>—Frame Length

Use this command to set the maximum link-layer frame information field size that the soft modem attempts to establish. <value 1> defines the field size for the sending direction in octets. <value 2> defines the field size for the receiving direction in octets and is not required.

+ER=<value>—Error Control Reporting

Use this command to turn on or turn off the error control report. If the compression report is enabled, the +ER:<type> intermediate result code reports the current DCE-DCE error control type. It is issued after the determination of the error control protocol and before the final result code (e.g., CONNECT). Specifically, the **+ER** intermediate result code is issued after the modulation report **(+MCR** and **+MRR)** and before the data compression report **(+DR)**.

+ER Control Reporting Commands:

+ER=0 This command enables error control report (default).

+ER=1 This command disables error control report.

+ER Error Control Reporting Intermediate Result Codes

+ER: NONE Data compression not in use.

+ER: LAPM V.42 LAPM protocol is in use.

+ER: ALT V.42 alternative protocol is in use.

+ES=<orig_rqst>,<orig_fbk>,<ans_fbk>—Error Control Selection

Use this command to select the error correction mode. If the modem is operated in V.80 mode (synchronous buffered mode), and **+ES=„8,** the **+ES?** will always return **+ES: 6,„**8. The setting of this command overwrites the **\N** command. However, the **+ES** command is overwritten by the setting on a **\N** command.

+ES Combinations:

+ES=1,0,1	Buffered mode.
+ES=0,1,0	Direct mode.
+ES=4,4,6	MNP or disconnect mode.
+ES=3,3,5	LAPM or disconnect mode.
+ES=4,0,6	MNP or buffered mode.
+ES=3,0,2	LAPM, MNP, or buffered mode (default).
+ES=2,0,2	LAPM or buffered mode.
+ES=3,2,4	LAPM, MNP, or disconnect mode.
+ES=„8	V.42 sync buffer mode (V.80 enabled).
+ES=6„8	V.42 sync buffer mode (V.80 enabled).

+ESR=<value>—Selective Repeat

Use this command to enable or disable the selective reject mode.

0 Enables the selective reject mode.

1 Disables the selective reject mode.

+ETBM=<pending_TD>,<pending_RD>,<timer>—Call Termination Buffer Management

Use this command to set the behavior of the modem during call termination. The <pending_TD> parameter controls how previously-transmitted data remaining in the DCE buffers is handled when the DTE request a disconnect from the call. The <pending_RD> parameter controls how previously-received data remaining in the DCE buffers is handled when the remote DCE disconnects the call. The <timer> parameter sets the maximum amount of time the soft modem will attempt to deliver the buffered data before abandoning the attempt and discarding any remaining data.

<pending_TD> Parameter Values:

0	Modem discards all buffered data immediately and disconnects.
1	Modem ignores the timer and attempts to deliver the data until it is acknowledged. If the remote DCE disconnects, discard the remaining data.
2	Modem attempts to deliver the data until the data is acknowledged. If the remote DCE dis-connects, or the timer expires, discard the remaining data.

<pending_RD> Parameter Values:

0	Modem discards all buffered data immediately and disconnects.
1	Modem ignores the timer and attempts to deliver the data until it is acknowledged. If the local DTE request a disconnect, discard the remaining data.
2	Modem attempts to deliver the data until the data is acknowledged. If the local DTE request a disconnect, or the timer expires, discard the remaining data.

<timer> Parameter Values:

0	Modem does not attempt to deliver data.
1—254	Modem attempts to deliver data for the amount of time set by the <timer> parameter.

+EWIND=<value_1>,<value_2>—Window Size

Use this command to set the maximum number of acknowledged frames allowed at the link layer. Changes set by the command take effect when the next connection is established. <value_1> sets the maximum window size for the transmit direction and <value_2> sets the maximum window size for the receive direction. The default value for <value_1> is 15.

+FCLASS=<value>—Service Class Indication

Use this command to set the modem service class. The service class determines if the modem is in data, FAX. The **+FCLASS** command is an extended syntax command.

+FCLASS Values:

+FCLASS=0	Selects the modems data mode.
+FCLASS=1	Selects the modems class 1 fax mode.

+GCAP—Request Complete Capabilities List

Use this command to display a list of the soft modems capabilities. This is an extended syntax command but it has only one form, **+GCAP**.

+GCAP Responses:

+FCLASS	T.class 1, +F	Class 1 FAX DCE control
+MS	+M commands	Modulation control: +MS/+MR
+ES	+E commands	Error control: +ES/+EB/+ER/+EFCS/+ETBM
+DS	+D commands	Data compression: +DS/+DR

+GCI=<T.35_country_code>—Country of Installation

Use this command to set the modem country code. ITU-T Recommendation T.35 defines the country codes and the country names.

+GMI—Manufacturer Identification

+GMI is an extended syntax command. It returns the modem manufacturer and either the OK or ERROR result code. The **+GMI=?** syntax returns an ERROR result code. The other two forms return an OK result code.

+GMM—Modem Identification

This command is supported to ensure compatibility with communication software that issues the **+GMM** command. The **+GMM** command returns the string "H.324 video ready rev 1.0."

+GMR—Request Revision Information

This command returns the version of the modem code.

+GOI—Request Global Object Identification

This command returns the ISO registration object identifier.

+GOI	Displays the ISO registration object identifier followed by the OK result code.
+GOI=?, **+GOI?**	Displays the ISO registration object identifier followed by the ERROR result code.

+GSN—Request Product Serial Number Identification

This command returns the product serial number.

+IDSR=<value>—Select Data Set Ready Option

Use this command to select how the soft modem manages the DSR signal (V.24 circuit 107).

+IDSR=0	DSR is always on.
+IDSR=1	DSR functions as defined in ITU-T recommendation V.24.

+IFC=<DCE_by_DTE>, <DTE_by_DCE>—DTE-DCE Local Flow Control

Use this command to select the local flow control method. The input parameters of the **+IFC** command overwrite the settings of the **\Q** and **\X<value>** commands. The reverse is also true. By modifying the settings of the **\Q** and **\X<value>** commands, the **+IFC** command parameters are overwritten.

+IFC=0,0	No flow control.
+IFC=1,1	Software flow control.
+IFC=2,2	Hardware flow control (default).
+IFC=3,1	Software flow control with XON/OFF characters passed on to the remote DCE.

+ILRR=<value>—DTE-DCE Local Rate Reporting

Use this command to display or hide the local rate report result code. If the rate report is enabled, the reported <rate> is the current DTE-DCE rate. The rate report is an intermediate result code. It is transmitted after any modulation, error control, or data compression reports, and before the final result code (e.g., CONNECT).

+ILRR=0	Disables the local rate report (default).
+ILRR=1	Enables the local rate report.

+IPR=<DTE rate>—Fixed DTE Rate

Use this command to set the DTE to DCE transmission rate. There are twelve fixed transmission rates used by the DTE to communicate with the DCE. This commands select one of the predefined transmission rates. If a rate is entered which is not supported, the transmission rate defaults to the next lower rate.

+IPR=0	Automatic rate detection (default).
+IPR=300	300 bits/s.
+IPR=1200	1200bits/s.
+IPR=2400	2400 bits/s.
+IPR=4800	4800 bits/s.
+IPR=9600	9600 bits/s.
+IPR=19200	19200 bits/s
+IPR=38400	38400 bits/s.
+IPR=57600	57600 bits/s.
+IPR=115200	115200 bits/s.
+IPR=230400	230400 bits/s.
+IPR=460800	460800 bits/s.
+IPR=921600	921600 bits/s.

+MA=<carrier 1>,<carrier 2>, ...—Modulation Automode Control

Use this parameter to define a list of modulations that the soft modem may use to connect with a remote modem for answering or originating automode (automatic modulation negotiation) data calls. The list acts as an extension to the modulation specified by the **+MS=<carrier>** command. The modulation identified by <carrier> in the **+MS** command limits the values in the **+MA** carrier list. Modulations which exceed the rate set by the **+MS** command, generate an ERROR result code and are not implemented by the soft modem. <carrier> values omitted from the list are not available for automode negotiation and are not used in automode negotiation even when the modem is capable of generating the modulation.

+MR=<value>—Modulation Reporting Control

Use this command to enable or disable modulation report result codes. When the modulation report is enabled, the DCE transmits the +MRR: <rate>, <rx_rate> and the +MCR:<carrier> intermediate result codes to the DTE. The <carrier> reported is the current modulation, for example, V.34. The <rate> reported is the transmit rate in bits per second or is zero if negotiation fails. The <rx_rate> is the receive channel rate and is only reported when different receive and transmit rates have negotiated.

The intermediate result codes are transmitted after the modulation and the

rate have been determined and before any error control or data compression reports or the final result code (e.g., CONNECT) is transmitted.

+MR=0 Enables the modulation report (default).

+MR=1 Disables the modulation report.

+MS=<carrier>,<automode>,<min_rate>,<max_rate>—Modulation Selection

Use this command to set the modem's modulation, the modulation's minimum and maximum transmission rate, and the status of automatic modulation negotiation (automode). The <carrier>, <min_rate>, and <max_rate> parameters define the modulation and its minimum and maximum rates.

The <automode> parameter enables or disables automatic modulation negotiation. If a subsequent **+MA** command is not provided, the automode parameters are constrained by the modulation set by the <carrier> parameter.

The **+MA** command can further restrict the automatic modulation negotiation settings but it cannot set a modulation that is higher than the modulation set by the **+MS** command.

Valid <carrier> Values:

V92	V.92 (default)
V90	V.90
V34	V.34
V32T	V.32ter
V32B	V.32 bis
V32	V.32
V22B	V.22 bis
V. 2 2	V. 2 2
Bell212A	Bell 212A*
V23C	V.23, constant carrier, asymmetric FDM
V21	V21
Bell103	Bell 103

Automatic modulation negotiation is enabled or disabled by <automode>. However, if a value is specified for the <max_rate>, then automatic rate selection is disabled and the modem will attempt to connect at the specified rate.

Valid <automode> Values:

0 Disables.

1 Enabled (default).

The <max_rate> specifies the highest connections rate for the DCE.

Valid <max_rate> Range:

0	Determined by modulation selected in <carrier> (default).
300—57333	Value limited by modulation selected in <carrier>.

Valid <max_rate> for each <carrier>:

V34	2400 bits/s—33600 bits/s in steps of 2400 bits/s.
V32bis	4800 bits/s—19200 bits/s in steps of 2400 bits/s.
V32	4800 bits/s—14400 bits/s in steps of 2400 bits/s.
V22bis	2400 bits/s.
V22	2200 bits/s.
V23C, Bell212A	1200 bits/s.
V.21, Bell103	300 bits/s.

+MSC=<src_v34>—Seamless Rate Change Enable

Use this command to enable or disable V.34 seamless rate changes.

+MSC=0	Disables V.34 seamless rate change.
+MSC=1	Enables V.34 seamless rate change (default).

+PCW=<call_waiting>—Call Waiting Enable

Use this command to select how the modem responds to a call waiting signal. The soft modems response is also dependent on the current setting of the caller ID command, **+VCID**.

Valid <call_waiting> Values:

0	Enable the call waiting detector. When a call waiting signal is detected, toggle V.24 circuit 125 and collect caller ID as set by **+VCID** (default).
1	Enable the call waiting detector. When a call waiting signal is detected, hang up the current call.
2	Disable call waiting detector.

+PIG=<value>—PCM Upstream Ignore

Use this command to enable or disable PCM upstream in a V.92 connection.

+PIG=0	Enable PCM upstream.
+PIG=1	Disable PCM upstream (default).

+PMH=<value>—Modem On Hold Enable

Use this command to enable or disable modem on hold. Note, that the **+PMH** command does not effect the parameters of the **+PMHT** command. The **+PMH** command only enables or disables modem on hold. The **+PMHT** command configures the modem to deny a modem on hold request or grant a modem on hold request with the selected hold time.

+PMH=0 Enables modem on hold (default).

+PMH=1 Disables modem on hold.

+PMHF—Modem On Hold Hook Flash

Use this command to generate a hook flash during modem on hold operations. The command causes the modem to go on-hook for a period of time set by S29. Then the modem returns to the off-hook state for at least 1.5 s.

+PMHR—Initiate Modem On Hold

Use this command to initiate a modem on hold request. Once the local modem receives this request from the user or controlling application, the soft modem requests that the remote modem go on hold. The remote modem either denies the request or grants the request. If the request is granted, the remote modem initialized the modem on hold timer and informs the local modem what the length of the hold duration is. If the request is denied, the local modem generates an ERROR result code and hangs up the line.

+PMHT=<value>—Modem On Hold Timer

Use this command to configure the soft modem to grant or reject a modem on hold request. This command configures the modem so it can respond to a modem on hold request. The command must be executed prior to reception of a modem on hold request. If a modem on hold request is made prior to execution of the +PMHT command, by default, the modem on hold request is denied.

This command also sets the modem on hold timer. The modem on hold timer sets the amount of time the modem will remain on hold waiting for the requesting modem to return to the line. If the timer expires, the soft modem will hang up the call.

+PMHT=0 Deny modem on hold request (default).

+PMHT=1 Grant modem on hold request with a 10 s time-out.

+PMHT=2 Grant modem on hold request with a 20 s time-out.

+PMHT=3 Grant modem on hold request with a 30 s time-out.

+PMHT=4 Grant modem on hold request with a 40 s time-out.

+PMHT=5 Grant modem on hold request with a 1 min. time-out.

+PMHT=6 Grant modem on hold request with a 2 min. time-out.

+PMHT=7 Grant modem on hold request with a 3 min. time-out.

+PMHT=8 Grant modem on hold request with a 4 min. time-out.

+PMHT=9 Grant modem on hold request with a 6 min. time-out.

+PMHT=10 Grant modem on hold request with a 8 min. time-out.

+PMHT=11 Grant modem on hold request with a 12 min. time-out.

+PMHT=12 Grant modem on hold request with a 16 min. time-out.

+PMHT=13 Grant modem on hold request with an indefinite time-out.

+PQC=<value>—V.92 Phase 1 and Phase 2 Control

Use this command to configure the V.92 short training sequence. This command selects which short phases are used during initiation of a connection. Once the modem is configured, use the **+PSS** command to enable or disable the short training sequence.

+PQC=0 Enable short phase 1 and short phase 2 (default).

+PQC=1 Enable short phase 1 only.

+PQC=2 Enable short phase 2 only.

+PQC=3 Disable short phase 1 and short phase 2.

+PSS=<value>—Use Short Sequence

Use this command to enable or disable the V.92 short training sequence.

+PSS=0 Use training sequence set in by the **+PQC** command.

+PSS=2 Use long training sequence.

+VCID=<value>—Caller ID

Use this command to enable or disable caller ID.

+VCID=0 Disable caller ID.

+VCID=1 Enable caller ID with formatted presentation.

+VCID=2 Enable caller ID with out formatting.

+FTH=<mod>—Transmit HDLC Data with <mod> Carrier

The **+FTH=<mod>** command causes the modem to transmit data framed in the HDLC protocol.

+FTH=3 V.21 channel 2. 300 bits/s.

+FTH=24 V.27ter. 2400 bits/s.

+FTH=48 V.27ter. 4800 bits/s.

+FTH=72 V.29. 7200 bits/s.

+FTH=96 V.29. 9600 bits/s.
+FTH=73 V.17. 7200 bits/s.
+FTH=74 V.17 (short train). 7200 bits/s.
+FTH=97 V.17. 9600 bits/s.
+FTH=98 V.17 (short train). 9600 bits/s.
+FTH=121 V.17. 12000 bits/s.
+FTH=122 V.17 (short train). 12000 bits/s.
+FTH=145 V.17. 14400 bits/s.
+FTH=146 V.17 (short train). 14400 bits/s.

+FTM=<mod>—Transmit FAX Data with <mod> Carrier

+FTM=<mod> command causes the modem to transmit data using the modulation defined as below.

+FTM=3 V.21 channel 2. 300 bits/s.
+FTM=24 V.27ter. 2400 bits/s.
+FTM=48 V.27ter. 4800 bits/s.
+FTM=72 V.29. 7200 bits/s.
+FTM=96 V.29. 9600 bits/s.
+FTM=73 V.17. 7200 bits/s.
+FTM=74 V.17 (short train). 7200 bits/s.
+FTM=97 V.17. 9600 bits/s.
+FTM=98 V.17 (short train). 9600 bits/s.
+FTM=121 V.17. 12000 bits/s.
+FTM=122 V.17 (short train). 12000 bits/s.
+FTM=145 V.17. 14400 bits/s.
+FTM=146 V.17 (short train). 14400 bits/s.

+FTS=<value>—Transmission Silence

+FTS=<value> causes the modem to terminate a transmission and wait for <value> x 10 ms before responding with the OK result code. For example, <value> = 5 results in a 50 ms interval. <value> has a range of 0—255.

A.1.2 FAX Commands

+FAA=<value>—Adaptive Answer

A service class 1 FAX DCE may have the ability to answer as a data modem DCE or as a FAX DCE. It may also be able to change from class 1 FAX mode to data modem operation in response to an incoming call.

Note: This command controls automatic switching from class 1 to class 0 for call answering only. It does not affect call origination, switching to class 1 from other classes, or switching to classes other than class 0.

+FAA=0 The DCE will answer only as a class 1 FAX device. No automatic switching of service class will occur based on the calling device type (default).

+FAA=1 The DCE can answer and automatically determine whether to answer as a facsimile DCE or as a data modem.

+FCLASS=1—Enter Class 1 FAX Mode

The **+FCLASS=1** command puts the modem in class 1 FAX mode.

+FMI?—Manufacturer Identification

This command returns: Agere Systems

+FMM?—Product Identification

This command returns the result: Data/FAX.

+FMR?—Version/Revision Information

This command returns the modem version code.

+FPR=<value>—Select FAX Port Rate

This command sets the DTE to DCE FAX port rate. The **+FPR** command is supported to assure compatibility with communications software that issues the this command. Soft modem products do not maintain the traditional relationship between the DTE and DCE that this command was designed to control. Soft modem products interface with the host system via a PCI or AC97 interface.

+FRH=<mod>—Receive HDLC Data with <mod> Carrier

Use the **+FRH** command to instruct the modem to receive data framed in the HDLC protocol at the modulation defined as below:

Command	Modulation	Speed
+FRH=3	V.21 channel	2. 300 bits/s.
+FRH=24	V.27ter.	2400 bits/s.
+FRH=48	V.27ter.	4800 bits/s.
+FRH=72	V.29.	7200 bits/s.

+FRH=96	V.29.	9600 bits/s.
+FRH=73	V.17.	7200 bits/s.
+FRH=74	V.17 (short train).	7200 bits/s.
+FRH=97	V.17.	9600 bits/s.
+FRH=98	V.17 (short train).	9600 bits/s.
+FRH=121	V.17.	12000 bits/s.
+FRH=122	V.17 (short train).	12000 bits/s.
+FRH=145	V.17.	14400 bits/s.
+FRH=146	V.17 (short train).	14400 bits/s.

+FRM=<mod>—Receive Data

Use the **+FRM** command to instruct the modem to received data using the modulation defined as below:

Command	**Modulation**	**Speed**
+FRM=3	V.21 channel	2. 300 bits/s.
+FRM=24	V.27ter.	2400 bits/s.
+FRM=48	V.27ter.	4800 bits/s.
+FRM=72	V.29.	7200 bits/s.
+FRM=96	V.29.	9600 bits/s.
+FRM=73	V.17.	7200 bits/s.
+FRM=74	V.17 (short train).	7200 bits/s.
+FRM=97	V.17.	9600 bits/s.
+FRM=98	V.17 (short train).	9600 bits/s.
+FRM=121	V.17.	12000 bits/s.
+FRM=122	V.17 (short train).	12000 bits/s.
+FRM=145	V.17.	14400 bits/s.
+FRM=146	V.17 (short train).	14400 bits/s.

+FRS=<value>—Receive Silence

+FRS=<value> causes the modem to listen and wait for <value> x 10 ms of silence to be detected on the line. For example, <value> = 5 results in a 50 ms interval. At the end of this period the modem responds with the OK result code. <value> has a range of 0—255.

+FTH=<mod>—Transmit HDLC Data with <mod> Carrier

The **+FTH=<mod>** command causes the modem to transmit data framed in the HDLC protocol at the modulation defined as below:

Command	Modulation	Speed
+FTH=3	V.21 channel 2.	300 bits/s.
+FTH=24	V.27ter.	2400 bits/s.
+FTH=48	V.27ter.	4800 bits/s.
+FTH=72	V.29.	7200 bits/s.
+FTH=96	V.29.	9600 bits/s.
+FTH=73	V.17.	7200 bits/s.
+FTH=74	V.17 (short train).	7200 bits/s.
+FTH=97	V.17.	9600 bits/s.
+FTH=98	V.17 (short train).	9600 bits/s.
+FTH=121	V.17.	12000 bits/s.
+FTH=122	V.17 (short train).	12000 bits/s.
+FTH=145	V.17.	14400 bits/s.
+FTH=146	V.17 (short train).	14400 bits/s.

+FTM=<mod>—Transmit FAX Data with <mod> Carrier

+FTM=<mod> command causes the modem to transmit data using the modulation defined as below:

Command	Modulation	Speed
+FTM=3	V.21 channel 2.	300 bits/s.
+FTM=24	V.27ter.	2400 bits/s.
+FTM=48	V.27ter.	4800 bits/s.
+FTM=72	V.29.	7200 bits/s.
+FTM=96	V.29.	9600 bits/s.
+FTM=73	V.17.	7200 bits/s.
+FTM=74	V.17 (short train).	7200 bits/s.
+FTM=97	V.17.	9600 bits/s.
+FTM=98	V.17 (short train).	9600 bits/s.
+FTM=121	V.17.	12000 bits/s.
+FTM=122	V.17 (short train).	12000 bits/s.
+FTM=145	V.17.	14400 bits/s.
+FTM=146	V.17 (short train).	14400 bits/s.

+FTS=<value>—Transmission Silence

+FTS=<value> causes the modem to terminate a transmission and wait for <value> x 10 ms before responding with the OK result code. For example, <value> = 5 results in a 50 ms interval. <value> has a range of 0—255.

A.2 Result Codes

The soft modem AT command handler responds to commands from the caller and to activity on the line via result codes. Table below presents a summary of these result codes.

Two forms of each result code are available. The long-form, or verbose, response is given when **V1** is selected, and the short-form, numeric response is given when **V0** is selected. The long-form code is preceded and terminated by the sequence <CR> <LF>. The short-form is also terminated by <CR>, but it has no preceding sequence. If result codes are suppressed, nothing is returned to the caller.

Result Code	**Numeric Code**	**Description**
OK	0	Acknowledges the execution of a command line.
CONNECT	1	Modem connected to line.
RING	2	Incoming ring signal has been detected.
NO CARRIER	3	Modem lost carrier signal, does not detect carrier signal, or does not detect answer tone.
ERROR	4	Invalid command.
CONNECT 1200 EC*	5	Connection at 1200 bits/s.
NO DIALTONE	6	No dial tone detected.
BUSY	7	Busy signal detected.
NO ANSWER	8	Remote end never answered.
CONNECT 2400 EC*	10	Connection at 2400 bits/s.
CONNECT 4800 EC*	11	Connection at 4800 bits/s.
CONNECT 9600 EC*	12	Connection at 9600 bits/s.
CONNECT 14400 EC*	13	Connection at 14400 bits/s.
CONNECT 19200 EC*	14	Connection at 19200 bits/s.
CONNECT 7200 EC*	24	Connection at 7200 bits/s.
CONNECT 12000 EC*	25	Connection at 12000 bits/s.
CONNECT 16800 EC*	86	Connection at 16800bits/s.
CONNECT 300 EC*	40	Connection at 300 bits/s.
CONNECT 21600 EC*	55	Connection at 21600 bits/s.
CONNECT 24000 EC*	56	Connection at 24000 bits/s.

CONNECT 26400 EC*	57	Connection at 26400 bits/s.
CONNECT 28800 EC*	58	Connection at 28800 bits/s.
CONNECT 31200 EC*	59	Connection at 31200 bits/s.
CONNECT 33600 EC*	60	Connection at 33600 bits/s.
CONNECT 38400 EC*	28	Connection at 38400 bits/s (DTE rate).
CONNECT 57600 EC*	18	Connection at 57600 bits/s (DTE rate).
CONNECT 115200 EC*	87	Connection at 115200 bits/s (DTE rate).
DELAYED	88	Delay is in effect for the dialed number.
BLACKLISTED	89	Dialed number is blacklisted.
BLACKLIST FULL	90	Blacklist is full.
CONNECT 32000 EC*	70	Connection at 32000 bits/s.
CONNECT 34000 EC*	71	Connection at 34000 bits/s.
CONNECT 36000 EC*	72	Connection at 36000 bits/s.
CONNECT 38000 EC*	73	Connection at 38000 bits/s.
CONNECT 40000 EC*	74	Connection at 40000 bits/s.
CONNECT 42000 EC*	75	Connection at 42000 bits/s.
CONNECT 44000 EC*	76	Connection at 44000 bits/s.
CONNECT 46000 EC*	77	Connection at 46000 bits/s.
CONNECT 48000 EC*	78	Connection at 48000 bits/s.
CONNECT 50000 EC*	79	Connection at 50000 bits/s.
CONNECT 52000 EC*	80	Connection at 52000 bits/s.
CONNECT 54000 EC*	81	Connection at 54000 bits/s.
CONNECT 56000 EC*	82	Connection at 56000 bits/s.
CONNECT 28000 EC*	100	Connection at 28000 bits/s.
CONNECT 29333 EC*	101	Connection at 29333 bits/s.
CONNECT 30666 EC*	102	Connection at 30666 bits/s.
CONNECT 33333 EC*	103	Connection at 33333 bits/s.
CONNECT 34666 EC*	104	Connection at 34666 bits/s.
CONNECT 37333 EC*	105	Connection at 37333 bits/s.
CONNECT 38666 EC*	106	Connection at 38666 bits/s.
CONNECT 41333 EC*	107	Connection at 41333 bits/s.
CONNECT 42666 EC*	108	Connection at 42666 bits/s.
CONNECT 45333 EC*	109	Connection at 45333 bits/s.
CONNECT 46666 EC*	110	Connection at 46666 bits/s.
CONNECT 49333 EC*	111	Connection at 49333 bits/s.
CONNECT 50666 EC*	112	Connection at 50666 bits/s.

CONNECT 53333 EC*	113	Connection at 53333 bits/s.
CONNECT 54666 EC*	114	Connection at 54666 bits/s.

A.3 S-Registers

The current setting of each S-register may be displayed by the **S<register number>?** command. There are two forms for this command.

S<register number> Extended Syntax:

S<register_number>? Displays register contents.

S<register_number>=<value>* Sets the contents of the register to <value>.

S-Register Summary:

Register	Description	Range Base	Unit	Default
S0	Auto answer ring number.	0—255	Rings	0
S1	Ring counter.	0—255	Rings	0
S2	AT escape character (user defined).	0—255	ASCII	43(2Bh)
S3	Carriage return character.	0—127	ASCII	13(0Dh)
S4	Line feed character.	0—127	ASCII	10(0Ah)
S5	Back space character.	0—255	ASCII	8(08h)
S6	Time for dial tone.	3—255	s	3 †
S7	Wait time for carrier.	1—255	s	50 †
S8	Pause time for dial delay modifier.	0—255	s	2 †
S9	Reserved.	—	—	—
S10	Reserved.	—	—	—
S11	DTMF tone duration.	50—255	ms	95 †
S12	Escape guard time.	0—255	20 ms	50

S14	General bit-mapped options status: command echo, quiet mode, result codes, tone/pulse.	—	—	138(10001010b)
S20	Sync underrun fill character.	0—255	—	0
S21	V.24/general bit-mapped options status: DTR behavior, DCD behavior.	—	—	48(00110000b)
S22	Speaker/results bit-mapped options status: speaker volume, speaker control, limit result codes, pulse dial make/break ratio.	—	—	70(01000110b)
S23	General bit-mapped options status: guard tone type, busy cycles, bell mode permitted flag, ABCD dialing permitted.	—	—	54(00110101b)
S27	General bit-mapped options status: V.90 upstream at 3429 Hz, remote digital loop-back request handling, bell compatibility mode, maximum DCE speed.	—	—	73(01001001b)
S28	General bit-mapped options status: pulse dialing, mode selection.	—	—	160(10100000b)
S29	Flash dial modifier time.	0—255	10ms	50
S30	Inactivity timer.	0—255	10 min.	0
S35	Reserved.	—	—	—
S36	LAPM failure control.	—	—	7
S37	Line connection speed.	—	—	0
S42	Reserved.	—	—	—
S43	Reserved.	—	—	—

S48	V.42 negotiation control.	—	—	7
S53	General bit-mapped options: calling tone flag, off-hook restrictions, blind dial pause, dial modifier validation, pulse and dial tone in same dial string.	—	—	47
S54	Blind dialing delay.	2—255	—	2
S56	General bit-mapped options.	—	—	0
S90	Reserved.	—	—	—
S91	PSTN transmit attenuation level.	6—25	–dB	10
S92	FAX transmit attenuation level.	6—25	dB	10
S93	DTMF transmit attenuation level.	5—25	dB	6
S94	DTMF transmit attenuation level for high DTMF group.	0—25	dB	0

Appendix B Specifications

Compatibility

ITU-T V.92 V.90	56000, 54667, 53333, 52000, 50667, 49333, 48000, 46667, 45333, 42667, 41333, 40000, 38667, 37333, 36000, 34667, 33333, 32000, 30667, 29333, 28000 bps.
ITU-T V.34Annex12	33600, 31200 bps.
ITU-T V.34	28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800 bps
ITU-T V.32 bis	14400, 12000, 9600, 7200, 4800 bps
ITU-T V.32	9600, 4800 bps
ITU-T V.17	14400bps/12000bps
ITU-T V.29	9600bps/7200bps
ITU-T V.27 ter	4800bps/2400bps
ITU-T V.22 bis	2400bps
ITU-T V.23	1200bps/75bps
ITU-T V.22	1200bps
ITU-T V.21	300bps
BELL 212A	1200bps
BELL 103	300bps

Modulation

56000bps(ITU-T V.90)	PCM
33600bps(V.34Annex12)	TCM
31200bps(V.34Annex12)	TCM
28800bps(V.34/V.FC)	TCM
14400bps (V.32 bis)	TCM
12000bps (V.32 bis)	TCM
9600bps (V.32 bis)	TCM
7200bps (V.32 bis)	TCM
9600bps (V.32)	TCM,QAM
4800bps (V.32)	QAM

14400bps (V.17)	TCM
12000bps (V.17)	TCM
9600bps (V.29)	QAM
7200bps (V.29)	QAM
4800bps (V.27ter)	DPSK
2400bps (V.27ter)	DPSK
2400bps (V.22bis)	QAM
1200bps/75bps(V.23)	FSK
1200bps (V.22/Bell 212A)	DPSK
300bps (V.21/Bell 103)	FSK

Operation

- Full-duplex or half duplex in Data mode.
- Half-duplex in Fax mode.
- Asynchronous operation.
- Auto dial/answer.
- Manual originate/answer.
- Call waiting
- Quick Connector
- Quick Upload

TAM

Support telephone answer machine.

Plug and Play

Optional Plug and Play device.

Data mode

- Ultrahigh compression throughput due to parallel access directly to the host PC.
- ITU-T V.34 extended rates 33600bps to 2400bps.
- V.32terbo, V.32bis and fallbacks.
- TIA/EIA 602 standard for AT command set.
- V.42 error correction (LAMP and MNP).
- V.42bis and MNP Class 5 data compression.

Fax mode

Fax modem send and receive rates up to 14400bps

- V.17, V.29, V.27ter, and V.21 channel 2.
- TIA/EIA 578 Class1 FAX.

Asynchronous Data Format

Parity	Data Length	Stop Bits	Character Length
None	7	2	10
Odd	7	1	10
Even	7	1	10
None	8	1	10

Line Operating Speed

56000bps, 52000bps, 48000bps, 40000bps, 36000bps, 32000bps.(Receive Only)

33600bps, 31200bps, 28800bps, 26400bps, 24000bps, 21600bps, 19200bps, 16800bps, 14400bps, 12000bps, 9600bps, 7200bps, 4800bps, 2400bps, 1200bps, 300bps.

Dialing Type

Tone or Pulse dialing.

Call Progress Monitors

Dial tone, Busy tone.

Diagnostics

- Remote digital loop and remote digital loop self test.
- Analog loop and analog loop self test.
- Power-on self test

Flow Control

XON/XOFF or RTS/CTS

Telephone Line Interface

Single RJ-11 phone jack for PSTN line.

Receive Sensitivity

-33 ± 2 dBm

Transmit Sensitivity

-11± 2 dBm

DTMF SIGNAL LEVEL (dBm)

Hi. G = -8± 2 dBm

Lo. G = -10± 2 dBm

M/B RATIO

39± 3/61± 4 10 PPS

RETURN LOSS

300Hz ~ 3400Hz >10 dB

Carrier Frequency

- V.34 1800Hz 0.01%
- V.32bis 1800Hz 0.01%
- V.32 1800Hz 0.01%
- V.17 1800Hz 0.01%
- V.29 1700Hz 0.01%
- V.27ter 1800Hz 0.01%
- V.22bis, original mode 1200Hz 0.01%
- V.22bis, answer mode 2400Hz 0.01%
- V.22, original mode 1200Hz 0.01%
- V.22, answer mode 2400Hz 0.01%
- V.21 channel #1, mark 980Hz 0.01%
- V.21 channel #1, space 1180Hz 0.01%
- V.21 channel #2, mark 1650Hz 0.01%
- V.21 channel #2, space 1850Hz 0.01%
- Bell 212A, original mode 1200Hz 0.01%
- Bell 212A, answer mode 2400Hz 0.01%
- Bell 103, original mark 1270Hz 0.01%
- Bell 103, original space 1070Hz 0.01%
- Bell 103, answer mark 2225Hz 0.01%
- Bell 103, answer space 2025Hz 0.01%

`DTMF Tone Frequency

		Low Group Frequency (Hz)			
		697	770	852	941
High Group Frequency (Hz)	1209	1	4	7	*
	1336	2	5	8	0
	1477	3	6	9	#
	1633	A	B	C	D

*Specification and features subjects to change without notice.

Appendix C Glossary

ASCII - An acronym for American Standard Code for Information Exchange. ASCII is a seven-bit code which defines 128 standard characters, including control characters, letters, numbers, and symbols. An extra 128 characters comprise the extended ASCII set.

Baud Rate - The transmission rate between two serial devices, e.g., modems, fax machines, etc. Measured in Bits Per Second.

Blind Dialing - In blind dialing, the modem continues to dial, regardless of the existence of a dialtone, ring, or busy signal.

BPS - Bits Per Second; the number of bits that can be transmitted in one second.

Carrier Signal - The analog data signal that a modem sends over telephone wires.

COMx - Where (x = 1, 2, 3, or 4), COMx is the name(address) of serial communications ports on personal computers. Each serial port in a personal computer has a different number.

CTS - Clear To Send.

Default - The assumed value that is used for a command parameter when no other value is explicitly provided.

DCD - Data Carrier Detect.

DCE - Data Communication Equipment.

DTE - Data Terminal Equipment.

DSVD - Digital Simultaneous Voice and Data.

DTMF - Dual Tone Multifrequency(for touchtone dialing).

DTR - Data Terminal Ready.

FSK - Frequency Shift Keying.

GSTN - General Switched Telephone Network.

Make/Break Ratio - The ratio of the off-hook (make) to on-hook (break) interval is the make/break ratio in pulse dialing.

Modem - A combination of the words MOdulator and DEModulator. Modems transform digital data into analog signals and back again.

Nonvolatile Memory - An area of memory inside the modem where the default configuration profile is stored. Values recorded in this memory will not be lost when the power is turned off.

Off-Hook - The condition when the modem has picked up the telephone line.

Off-Line Command State - A modem state in which the modem accepts, interprets and executes commands from an asynchronous computer or terminal.

On-Hook - The condition when the modem has not picked up the telephone line; the telephone is hung up.

On-Line - A carrier signal link with a remote modem has been established; communication is in progress.

On-Line State - A modem state in which the modem is connected with a remote modem. Data can be sent or received from the remote modem in this state. No commands will be accepted from the modem except the escape command which will bring the modem into the on-line command state.

On-Line Command State - A modem state in which the modem can accept or and execute commands from an asynchronous computer or terminal while remaining connected with the remote modem. The user can return the modem to the on-line state by issuing the **AT0n** command or put it into the off-line command state by issuing commands such as **ATZ** or **ATH**.

Parity - An error-checking method by which the modem verifies that the data just sent is correct.

pps - Pulse per second.

Profile - A list of default settings.

Protocol - A technical specification for serial communications; the protocols supported by the modem are listed in Appendix B.

PSK - Phase Shift Keying.

Pulse Dialing - A dialing form in which each digit is represented by a series of pulses. Rotary telephones all use pulse dialing.

QAM - Quadrature Amplitude Modulation.

Result Codes - The response the modem returns to the screen upon executing a command.

RAM - Random Access Memory.

ROM - Read-Only Memory. A chip inside the modem which stores the factory default settings. This memory cannot be changed.

RTS - Request To Send.

RX - Reception.

S Register - RAM locations in the modem which store the active configuration.

Serial Port - See COMx.

TCM - Trellis-Coded Modulation.

Touchtone Dialing - A dialing format in which each digit is represented by a musical frequency.

TX - Transmission.

Appendix D ASCII Code Table

Decimal	Hex	Value	Decimal	Hex	Value	Decimal	Hex	Value	Decimal	Hex	Value
000	00	NUL	032	20	(space)	064	40	@	096	60	'
001	01	SOH	033	21	!	065	41	A	097	61	a
002	02	STX	034	22	"	066	42	B	098	62	b
003	03	ETX	035	23	#	067	43	C	099	63	c
004	04	EOT	036	24	$	068	44	D	100	64	d
005	05	ENQ	037	25	%	069	45	E	101	65	e
006	06	ACK	038	26	&	070	46	F	102	66	f
007	07	BEL	039	27	'	071	47	G	103	67	g
008	08	BS	040	28	(	072	48	H	104	68	h
009	09	HT	041	29	)	073	49	I	105	69	i
010	0A	LF	042	2A	*	074	4A	J	106	6A	j
011	0B	VT	043	2B	+	075	4B	K	107	6B	k
012	0C	FF	044	2C	,	076	4C	L	108	6C	l
013	0D	CR	045	2D	-	077	4D	M	109	6D	m
014	0E	SO	046	2E	.	078	4E	N	110	6E	n
015	0F	SI	047	2F	/	079	4F	O	111	6F	o
016	10	DLE	048	30	0	080	50	P	112	70	p
017	11	DC1	049	31	1	081	51	Q	113	71	q
018	12	DC2	050	32	2	082	52	R	114	72	r
019	13	DC3	051	33	3	083	53	S	115	73	s
020	14	DC4	052	34	4	084	54	T	116	74	t
021	15	NAK	053	35	5	085	55	U	117	75	u
022	16	SYN	054	36	6	086	56	V	118	76	v
023	17	ETB	055	37	7	087	57	W	119	77	w
024	18	CAN	056	38	8	088	58	X	120	78	x
025	19	EM	057	39	9	089	59	Y	121	79	y
026	1A	SUB	058	3A	:	090	5A	Z	122	7A	z
027	1B	ESC	059	3B	;	091	5B	[	123	7B	{
028	1C	FS	060	3C	<	092	5C	\	124	7C	|
029	1D	GS	061	3D	=	093	5D	]	125	7D	}
030	1E	RS	062	3E	>	094	5E	^	126	7E	~
031	1F	US	063	3F	?	095	5F	_	127	7F	■